BIBLIOGRAPHY OF Technical Reports

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May 15, 1953 Vol. 19, No. 5

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Effect of diisopropyl fluorophosophate (DFP) on the muscular contraction produced by adenosine triphosphate (ATP), by B. P. McNamara and Maggie Quille. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Jan 1953. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108832

CMLRE-ML-52. Project no.: 4-08-02-008. Test Program no.: T5.
1. Diisopropyl fluorophosphate - Physiological effects 2. Adenosine triphosphate - Physiological effects 3. Muscles - Effects of drugs 4. Rabbits - Muscles - Effects of drugs 5. CC MD RR 158.

Effectiveness of various drugs in prevention of airsickness, VIII: Evaluation of various techniques for screening anti-motion-sickness drugs, by Herman I. Chinn and Nicholas P. Plotnikoff. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Dec 1952. 7p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108650

Hyoscine, Benadryl, and Lergigan did not increase the vomiting threshold of dogs to apomorphine injection, nor did nay of them protect dogs against swing sickness. Hyoscine protected human subjects on the swing, but Lergigan and Benadryl were without effect. The lack of correlation between these findings and the effectiveness of these preparations in air and seasickness are discussed. AAF SAM Proj. 21-32-014, Report no. 8.

Further evaluation of drugs for the prevention of seasickness, by Herman I. Chinn, Stanley W. Handford, Paul K. Smith, Thomas E. Cone, Robert F. Redmond, James V. Maloney, and Cheves McC. Smythe. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Joint project report, U. S. Navy and U. S. Air Force. Dec 1952. 11p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108651

The following preparations afforded significant protection against seasickness when tested aboard Navy transports: Lergigan, Phenergan, Trimeton, Benadryl, Parsidol, Pyrrolazote, Wellcome 47-83, Schering preparation 1667, Multergan, Parke-Davis S-45, Trimeton-scopolamine mixture, and Postafene. Lisergan, Probanthine, Isophenergan, Bentyl, Diparcol, Buscopan, Dramamine, Mosidal, Banthine, and Dibenzylene were in effective. The incidence of seasickness decreases progressively with increasing age between 17 and 39. Similarly, the incidence decreased with increasing weight. Seasickness was least among those quartered amidships, increasing both fore and aft. The probable chemical identity of Phenergan and Lergigan was discussed. The relationship between chemical structure and pharmacological activity was considered. AAF SAM Proj. 21-32-014, Report no. 10.

Pharmacological properties of Trafuril, a new nicotinic acid ester with hyperemia-producing action, by F. Gross and E. Merz. Translated by W. J. Woodside, Scientific Intelligence Division, Defence Research Board, Canada. Feb 1950. 14p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108753

Pharmacological investigations were made of a new ester of nicotinic acid, tetrahydrofurfuryl ester (Trafuril), which has a vasodilator effect. In contrast to other nicotinic acid esters this ester is equally soluble in water and in oil. In tests with animals, the substance proved itself to have very little toxicity with single and chronic application. The preparation is distinguished by its hyperemia-producing effect when applied locally to the human skin. Intravenous injection of Trafuril causes strong peripheral vasodilation, which is shown in a distinct multiple hyperemia in the skin-muscle region. Trafuril lowers blood pressure slightly and inhibits peristalis when given in relatively large doses. Translated from Schweizerische medizinische wochenschrift, vol. 78, p. 1151 (1948).

Toxicological action of ethyl thiocyanate (C_2H_5SCN) and hydroxybutyl thiocyanate ($HO(CH_2)_4SCN$), by Bernard P. McNamara and Carl W. Bender. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Oct 1952. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108443

Project no: 4-08-008. Test Program no.: T5. CMLRE-ML-52.
1. Ethyl thiocyanate - Toxicity 2. Hydroxybutyl thiocyanate - Toxicity 3. Rabbits - Effects of drugs 4. Thiocyanates - Toxicity 5. CC MD RR 137.

Plastics and Plasticizers

Heat resistant laminating resins, by Robert G. Nelb, Charles H. Alexander, Paul M. Elliott. United States Rubber Company. Naugatuck Chemical Division, Naugatuck, Conn. Jun 1952. 35p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108757

Research was undertaken to develop and evaluate low pressure heat resistant laminating resins based on the trifunctional monomer, triallyl cyanurate, which would have flexural strengths of 45,000 psi at 300°F, and 30,000 psi at 500°F during both short and long exposures to these temperatures. A study of post-cures was made with both Vibrin X-1047 and X-1422 over the temperature range of 350 to 500°F and from one to twenty-four hours. An improved method for preparing triallyl cyanurate in large laboratory batches in yields of 95% has been worked out. This method uses sodium hydroxide in place of the metallic sodium which has been previously used. Contract no. AF33(038)-11821. AAF TR 6602.

Preparation and casting of sheets of polymethyl alpha-chloroacrylate, by H. D. Anspon. General Aniline and Film Corporation. Central Research Laboratory, Easton, Pa. Jan 1951. 63p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108764

A description is presented of the preparation, purification, casting, and polymerization of methyl alpha-chloroacrylate as employed in the preparation of transparent sheets of polymethyl alpha-chloroacrylate. These transparent colorless sheets possessed heat distortion temperatures above 250°F (121°C) and were prepared for evaluation as sheet material for the glazing of supersonic aircraft. Contract no. AF33(038)-2370. AAF TR 6384.

Room-temperature curing metal-to-metal adhesives, by A. E. Smith, P. M. Elliott, H. W. Robinson. United States Rubber Company. Naugatuck Chemical Division, Naugatuck, Conn. Mar 1951. 19p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108755

The results of the work of the last twelve months on a program for the development of a room-temperature curing adhesive suitable for use on structural aircraft metals and plastics are discussed. Formulations and strength values are presented for the best adhesives so far developed, which have been passed on either ethyllenic-type polymers or epoxy resins. The adhesives were evaluated by bonding clad 24S-T3 aluminum alloy sheet to itself, and then testing these bonds in tensile shear. Contract no. AF33(038)-9281. AAF TR 6514.

Shock tube tests of glazing materials, by William J. Taylor and Robert O. Clark. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1952. 37p photos, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111111

In the event of an atomic bomb attack, the hazard of flying glass may extend over an area of approximately two hundred square miles. This investigation provides evidence that the area of common window glazing hazard could be reduced to coincide with the area of moderate structural damage or to approximately seven square miles, by proper selection of glazing material. Project no. TB 3-0112 of the Research and Development Div., Ordnance Corps. APG BRL M626.

Studies in the field of phthalocyanines, by J. Willoch, T. Zawadzki and N. Vasileff. Princeton University. Plastics Laboratory. Jun 1951. 29p drawing, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108915

A theory relating the spatial arrangement of the atoms in a molecule with the dielectric constant is reviewed. From this theory it was concluded that one of the metal phthalocyanines might have a high idielectric constant and a low dissipation factor. Several specimens of this material were prepared and tested for dielectric constant and dissipation factor along with some commercial phthalocyanines. Contract report no. 3A on Contract no. DA36-039-sc-133. Dept. of the Army project: 3-99-15-022. Signal Corps project: 32-152B-0. PU PL TP 21A.

Vinyl acetate emulsion paints, translated by P. W. Blaylock and A. H. Andersen, Canadian Dept. of Reconstruction. I. G. Farbenindustrie A. G., Höchst, Ger. 1945. 13p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 99911t

Translation of Micro BIOS DOCS 1932/607/7.
1. Micro BIOS DOCS 1932/609/7, Translation 2. Micro BIOS FD 525/47, Frames 141-151, Translation.

Paints, Varnishes and Lacquers

Bleicyanamid, ein neues rostschutzpigment (Lead cyanamide, a new rust-preventing pigment). I. G. Farbenindustrie A. G., Frankfurt am Main, Ger. n.d. 22p photos, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 99911s16

Listed in BIOS FR 628, p. 104.
1. Lead cyanamide - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/17 4. Micro BIOS FD 525/47, Frames 231-252.

Emulsionen für anstrichzwecke (Emulsions for use in paints.) I. G. Farbenindustrie A. G., Frankfurt am Main, Ger. n.d. 8p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s4

Listed in BIOS FR 628, p. 103.
1. Emulsifying agents - Germany 2. Acronal 430D (Trade name) 3. Acronal 300D (Trade name) 4. Mowilith D32 (Trade name) 5. BIOS FR 628 LD 6. Micro BIOS DOCS 1932/609/5 7. Micro BIOS FD 525/47, Frames 126-133.

Kurzprüfungen (Quick tests). Wiederhold, Hermann, Lackfabrik, Hilden, Ger. n.d. 2p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s17

Listed in BIOS FR 628, p. 100 and p. 104.
1. Paints - Tests - Specifications - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/18 4. Micro BIOS FD 525/47, Frames 253-254.

Mowilith-dispersionen für anstrichzwecke (Mowilith dispersions for use in paints). I. G. Farbenindustrie A. G., Frankfurt am Main, Ger. Aug 1945. 11p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 99911s6

Listed in BIOS FR 628, p. 104.
1. Mowilith D (Trade name) 2. Mowilith D32 (Trade name) 3. Emulsifying agents - Germany 4. BIOS FR 826 LD 5. Micro BIOS DOCS 1932/609/7 6. Micro BIOS FD 525/47, Frames 141-151.

Richtlinien für prüf-und verarbeitungsbedingungen von lacken für WEHRM-A2-dosen (Directions for the testing and use of lacquers for WEHRM-A2 cans). Wiederhold, Hermann, Lackfabrik, Hilden, Ger. n.d. 4p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s14

Listed in BIOS FR 628, p. 104.
1. Lacquers - Tests - Germany 2. Containers, Food - Coatings - Germany 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/15 5. Micro BIOS FD 525/47, Frames 223-226.

Schnellverwitterungs-apparate nach Blom-Keyl (Accelerated weathering apparatus, according to Blom-Keyl), by Hugo Keyl, Dresden, Ger. n.d. 2p photo (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s18

Listed in BIOS FR 628, p. 105.
1. Paints - Weathering apparatus - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/19 4. Micro BIOS FD 525/47, Frames 255-256.

Verabeitungsvorschrift für atephen (Manufacturing instructions for atephen). I. G. Farbenindustrie A. G., Frankfurt am Main, Ger. Nov 1944. 4p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s15

Listed in BIOS FR 628, p. 104.
1. Atephen (Trade name) 2. Lacquers, Synthetic - Manufacture - Germany 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/16 5. Micro BIOS FD 525/47, Frames 227-230.

Vorläufige technische lieferbedingungen für anstrichstoffe E und EH. Die abnahmeuntersuchungen für nitro-kombinationsstreichlackfarben und EH anstrichstoffe erfolgen nur in der Chemisch-Technischen Reichsanstalt (Provisional Army specification for paints E and EH. Acceptance test for staining lac dyes of nitro compounds and EH paint materials followed only in the Chemisch-Technischen Reichsanstalt). Ruth, Gustav, Temperol-Werke, Hamburg, Ger. Feb 1941. 7p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s13

TL 6317B. Listed in BIOS FR 628, p. 104.
1. Paints - Specifications - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/14 4. Micro BIOS FD 525/47, Frames 216-222.

Chemical Engineering and Equipment

Einrichtungen für lack- und firnisfabriken (Equipment for lacquer and varnish factories) Catalog, edition 38. Sommer-Schmidding Werke, G.m.b.H., Düsseldorf, Ger. n.d. 125p photos (Text in German and English) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 99911s27

Frames 460-464 are in English. Listed in BIOS FR 628, p. 96 and p. 105.
1. Lacquers - Manufacture - Equipment - Germany 2. Varnishes - Manufacture - Equipment - Germany

3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/29 5. Micro BIOS FD 525/47, Frames 325-441, 460-464.

Planetenmischmaschine PM 150 (Planetary mixing machine PM 150). Vögele, Joseph, A. G., Mannheim, Ger. Sep 1940. 1p drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s26

Drawing no. P1350. Listed in BIOS FR 628, p. 105.
1. Machines, Mixing - Design - Germany 2. PM 150 (Planetary mixing machine) 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/28 5. Micro BIOS FD 525/47, Frame 324.

Preparation of diborane, an A.E.R.E. report, by F. Hudswell, J. S. Nairn and K. L. Wilkinson. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1951. 11p photo, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108564

Improvements in the details of the preparation of diborane are reported. A full description of the steps in the procedure is given. Safety aspects are discussed. HD. 462. S. O. code no. 70-674-0-24. AERE C/R 652.

Samka berohrt & doppelwand. (Samka tubular and double-jacketed heating equipment). Samesreuther & Co., G.m.b.H., Butzbach, Ger. n.d. 12p photos (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 99911s28

Listed in BIOS FR 628, p. 96 and p. 106.
1. Heating equipment - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/30 4. Micro BIOS FD 525/47, Frames 464-476.

Säuerfeste ausmauerung zum druck und distillierkessel (Acid-proof ceramic lining for pressure and distillation kettle). Didier Werke A. G., Bonn, Ger. Jul 1939. 5f drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $1.50. PB 108796

Drawing no. 2389. English abstract included. Abstract available as PB 108796s from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $1.25, Photostat $1.25.
1. Distillation - Apparatus - Design - Germany 2. Methacrylic acid, Methyl ester - Production - Apparatus - Germany 3. Micro BIOS DOCS/1482/2181 4. Micro BIOS FD 1011/47, Frames 1 + 4.

Stirring apparatus for production of methyl methacrylate. Aktiengesellschaft Kühnle, Kopp & Kausch, Frankenthal, Ger. 1935. 9f drawing (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $2.50. PB 108797

Abstract included. Abstract available as PB 108797s from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
1. Stirring apparatus - Design - Germany 2. Methacrylic acid, Methyl ester - Production - Apparatus - Germany 3. Micro BIOS/DOCS/218 4. Micro BIOS FD 1023/47, Frames 1 + 8.

Unterer deckel zum ofen 12001 (Converter head gaskets). Hochdruck-Apparate-Bau, G.m.b.H., Dortmund, Ger. Jul 1936. 8p drawings only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 81280s47

Listed in FIAT FR 1067, p. 16 as MM 78. Part of drawing is reproduced as fig. 8, p. 25 of FIAT FR 1067.
1. Pressure vessels - Gaskets - Design - Germany 2. FIAT MM78 3. FIAT FR 1067, supplement 47.

Untersuchung von geschweissten doppelwand-dampfkassern der chemischen industrie (Testing of welded steam-heated vessels used in the chemical industry), by E. Block. 1940. 7p photos, drawings, graph (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s29

Reprinted from Chemische fabrik, jahrg. 13, p. 281-287. Listed in BIOS FR 628, p. 106.
1. Chemical apparatus - Tests - Germany 2. Heating equipment - Germany 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/31 5. Micro BIOS FD 525/47, Frames 477-483.

Miscellaneous Chemicals

Acronale (Acronals). I. G. Farbenindustrie A. G., Frankfurt, Ger. Apr 1937. 4p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s7

Listed in BIOS FR 628, p. 104.
1. Acronals (Trade name) 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/8 4. Micro BIOS FD 525/47, Frames 152-155.

Acronal 500D u. 300D (Acronal 500D and 300D). I. G. Farbenindustrie A. G., Frankfurt, Ger. n.d. 2p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s8

Listed in BIOS FR 628, p. 104.
1. Acronal 500D (Trade name) 2. Acronal 300D (Trade name) 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/9 5. Micro BIOS FD 525/47, Frames 156-157.

Acronal 700. I. G. Farbenindustrie A. G., Frankfurt, Ger. n.d. 2p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s9

Listed in BIOS FR 628, p. 104.
1. Acronal 700 (Trade name) 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/10 4. Micro BIOS FD 525/47, Frames 158-159.

Algen- literatur: Algen, alginsaure und alginate 1900-1942 (Algen bibliography: Algin, alginic acid, and alginates, 1900-1942). Herberts, Kurt, & Co., Wuppertal, Ger. n.d. 52p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 99911s10

References from Chemisches Centralblatt. Listed in BIOS FR 628, p. 104.
1. Alginic acid - Bibliography - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/11 4. Micro BIOS FD 525/47, Frames 160-211.

Chemical research reports (Reppe documents). I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Apr 1940-Nov 1944. 839f drawing, graphs, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $110.00. PB 105485

Some frames will not reproduce well. See also Micro FIAT CC 254 (PB 105487) and Micro FIAT CC 255 (PB 105489). Contents: Über eisencarbonyle und carbonyleisen (On iron carbonyl and carbonyl-iron) by A. Mittasch. From Zeitschrift für angewandte chemie jahrg, 41, no. 30, p. 827-833, 28 July 1928. Neue synthese der adipinsäure (New synthesis of adipic acid) (Will not reproduce well). - Neue esterharze auf anthracenbasis (New resin ester with anthracene base) by Dr. Krzikalla, Dr. Woldau, and Dr. Dornheim at 25. meeting of the Kunstoff-Kommission, 21-22 Nov 1941, Frankfurt am Main. - Versuche von darstellung von acrylamiden aus aminen, kohlenoxyd und acetylen (Research on production of acrylamides from amines, carbon oxide and acetylene) by Dr. Gassenmeier. B 248. Jun 13, 1940. - Versuche zur darstellung von acrylester aus kohlenoxyd, acetylin und alkohol mit einem katalysator (Research on production of acrylester from carbon oxide, acetylene and alcohol with a catalyser) by Dr. von Bank. 28 May 1940. - Bericht über die herstellung von adipinsäure aus tetrahydrofuran und kohlenoxyd, 3. teil (Report on production of adipic acid from tetrahydrofurane and carbon oxide, part 3) May 25, 1944. - Die durch anlagerung von acetaldehyd an acetylen zugänglichen verbindungen (Blending of acetaldehyde with acetylene) by Dr. Joost. Jun 10, 1941. - Über das nickelcarbonyl $Ni(Co)_4$ (Nickel carbonyl $Ni(Co)_4$) by Karl Merkel. 20 Feb 1941. - Cyclooctotetraen nach Reppe (Cyclooctetraens according to Reppe) by Dr. Topel. 13 Mar 1942. - Ein neuer weg zu butadien und anderen dienen aus acetylen und aldehyden bzw. ketonen (A new approach to butadiene and other dienes from acetylenes and aldehydes or ketones) by Dr. Reppe. 12 Jan 1946. - Über die partielle hydrierung einiger alkohole mit dreifach bindung (Partial hydrogenation of some alcohols with triple linkage) by Dr. Friederich and Dr. von Susich. 28 Apr 1942. Über die verwertung des 1,4-butandioldestillationsrückstände der B-IIIanlage (Utilization of 1,4-butanediol distillation residues of the B-III installation) by Dr. Krzikalla and Dr. Flickinger. 30 Nov 1944. - Kontinuierliche darstellung von 1,4-butandiol dichlorkohlensäureester (Continuous production of 1,4-butanediol dichlorocarbonic acid ester) 2 Mar 1944 (Will not reproduce well). - Reinheitsbestimmungen an butadien (Determination of the purity of butadiene) by Dr. Wenning, 12 Dec 1941. - Fortschritte der acetylenchemie im Werk Ludwigshafen am Rhein der I. G. Farbenindustrie A. G. (Progress of acetylene chemistry in the Ludwigshafen plant of I. G. Farbenindustrie) Address of Dr. Reppe at the first meeting of the society "Methods of organic chemistry" in Berlin-Dahlem 26 Juli 1940. - Eine neue synthese von acrylsäure und ihren derivate (A new synthesis of acrylic acid and its derivatives) by Dr. Reppe. B302. 14 Dec 1940. - Über die herstellung von waschrohstoffen und textilhilfsmitteln aus ungesättigten kohlewasserstoffen durch anlagerungen von CO und alkoholen bzw. wasser (Production of washed raw materials and textile aids from unsaturated hydrocarbons by addition of CO and alcohols or water) by Dr. Kröper, Dr. Bretschneider, Dr. Pistor, Dr. Schlenk. 14 Dec 1940. - Über die von physikalischen betrieb in den jahren 1940/41 angestellten versuche zur bestimmung des beim acetylenzerfalls auftretenden druckes and zur auffindung von mitteln zur verbinderung des überganges von explosiblen zum detonations artigen zerfall (Work in physics during 1940/41, staff research to determine the pressure under which decomposition of acetylene occurs and to discover the connection of explosions with detonation-like decomposition. 24 Sep 1942. - Spaltung von vinylmethyläther mit hilfe eines säurehaltiges festungsordneten kontaktes (Fission of vinyl methyl ether by the aid of an acid-containing, strongly-fortified contact) by Dr. Pesta. 11 May 1942. - Über die diskontinuierliche und kontinuierliche darstellung von essigsäure aus methanol und kohlenoxyd (On the intermittent and continuous production of acetic acid, from methanol and carbon oxide) by Dr. von Kutepow. 15 May 1942. - Über die synthese der essigsäure durch einwerkung von kohlenoxyd auf methanol unter druck (Synthesis of acetic acid by the action of carbon oxide on methanol under pressure) by Dr. Pistor. 21 Apr 1942. - Synthese der essigsäure durch einwerkung von kohlenoxyd auf methanol, sommer 1941-Jun 1942 (Synthesis of acetic acid by the action of carbon oxide on methanol, summer 1941-Jun 1942) by Dr. Kröper, Dr. Pistor, Dr. Kutepow. 30 Jun 1942. - Polyvinyl pyrroliden (Perriston, Kollidone) (Polyvinyl pyrrolidines (Perriston, Kollidone) by Dr. Fikentscher and Dr. Herrls. 10 Nov 1943. - Über die katalytische acrylsäurebutylester darstellung im rieselofenverfahren mit polyglykolen als flüssigen kontaktträger und $NiBr_2$ als wirksamer kontaktsubstans (On catalytic production of acrylic acid butyl esters in cooling oven experiments with polyglycols as flowing contact carrier and $NiBr_2$ as effective contact substance) 15 Apr 1943. - Über den technischen butadienkontakt (Technical butadiene contact) 25 Apr 1942. - Wissenschaftliche Zetko 1941: Über sulfondibuttersäure und ihre ester (Sulfodiisobutyric acid and its ester) by Dr. Krzikalla and Dr. Hochadel. -

Über partielle hydrierung einiger alkohols mit dreifachbindung (Partial hydrogenation of some alcohols with triple linkage) by Dr. Friederich and Dr. von Susich Jun 5, 1942 (Mostly illegible). - Methylbutinol (Methyl butynol) by Dr. Pesta and Dr. Ebel. 20 Apr 1940. - Technisch durchfuhrbare oberflächen-metallisierungsverfahren (Technical practical surface-metallizing experiments) 1 Jul 1944 (Will not reproduce well). - Über die reaktion von kohlenoxyd mit olefinen und alkohol, 1. bericht (Report no. 1 on the reaction of carbon oxide with olefins and alcohol) by Dr. Schlenk. 3 Oct 1940. - Bericht von Dr. Pistor über die einwirkung von kohlenoxyd auf olefins auch alkohols (Dr. Pistor's report on the effect of carbon oxide on olefins and alcohols) 5 Oct 1940. - Synthese von fettsäureestern durch einwirkung von kohlenoxyd auf olefine und alkohols. Bericht von Dr. Bretschneider von Feb bis mitte Aug 1940 (Synthesis of sebacic acid esters by reactions of carbon oxide on olefins and alcohols. Report by Dr. Bretschneider on work from Feb to the middle of August 1940). Sep 27, 1940. Synthese von fettsäureestern durch einwirkung von kohlenoxyd auf olefine und alkohols, Jan bis Juli 1940 (Synthesis of sebacic acid esters, by reactions of carbon oxide on olefins and alcohols, Jan-Jul 1940) by Dr. Kröper. 23 Sep 1940. - Einwirkung von kohlenoxyd auf olefine und alkohols (1. Zusammenfassung der berichte von Dr. Kröper, Bretschneider, Pistor und Schenck, ende Jan bis anfang Aug 1940) (Effect of carbon oxide on olefins and alcohols) (Collection of reports of Drs. Kröper, Bretschneider, Pistor and Schenck on work from the end of Jan to the beginning of Aug 1940) 9 Oct 1940. - Bericht über die einwirkung von kohlenoxyd auf tetrahydrofuran in gegenwart von kobaltkatalysatoren (Report on the effect of carbon oxide on tetrahydrofurane in the presence of cobalt catalysts) 30 Mai 1944. - Über die katalytische acrylsäurebutylesterdarstellung im rieselofenverfahren mit nickelkontakten (Catalytic production of acrylic acid butyl esters in cooling oven experiments with nickel contacts) by Dr. Hecht, Dr. Merkel II and Dr. Reindl. B402. 15 Aug 1941. - Bemerkungen sur kalkulation und kostenschätzung für eine grossanlage (vinylierung und spaltung) zur herstellung von 500-mol acetaldehyd (Note on calculation and estimate of cost of a large installation (vinylation and fission) for production of 500-mol acetaldehyde) 11 May 1942 (Drawing will not reproduce). - Spaltung von vinyläther mit hilfe eines säurehältiges festungsordneten kontaktes (Fission of vinyl methyl ether by the aid of an acid-containing, strongly fortified contact) by Dr. Pesta. 11 May 1942. (Will not reproduce well). - Über die kontinuierliche herstellung von ∝-pyrroliden (Continuous production of ∝-pyrrolidone) 3 Mar 1944 (Will not reproduce well). - Cyclooktetraen (Cyclooctotetraene) by Dr. Töpel. 2 Oct 1941. - Raman-aufnahme von cyclooctatetraen, ihre hestellung und probe (Raman spectra of cyclooctotetraene, its pattern and proof) by Dr. Töpel. 4 Oct 1940. - Über die gewinnung von hexadiindiol aus propargylalkohol (Production of hexadiindiol from propargyl alcohol) by Dr. Köhler. Oct 7 1946. - Über eine bestimmung des propylargylalkohols (Determination of propargyl alcohol) 17 Apr 1940. - Über die herstellung von propionaldehyd aus propargylalkohol (Production of propion aldehyde from propargyl alcohol) by Dr. Trieschmann and Dr. Reicheneider, 15 Apr 1940. - Chemical formulas no. 1-36. This reel contains the following items which were not legible on PB 105489 as listed in Bibliography of Technical Reports, V. 18, no. 6, p. 153-155: Items no. 2-8, 15-16, 22, 27-28, 32, 35, 41, 43, 45, 53, 64, 68-69, 74-75, 80, 82. Micro FIAT CC 256.

Complex ions formed by thorium and uranium with complexones, an A.E.R.E. report, by M. J. Cabell. Gt. Brit. Ministry of Supply. Atomic Engery Research Establishment. Jul 1951. 31p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 108565

Potentiometric titrations have been used to show that thorium and uranyl ions from complexes with nitrilotriacetic acid (N.T.A.) and ethylenediamine tetra-acetic acid (E.D.T.A.). In the case of thorium the shapes of the titration curves indicate definite stable ionic species. The uranyl complexes are much less stable, hydrolyse much more readily and the uranium is precipitated as the pH is increased. The acid dissociation constants of N.T.A. and E.D.T.A. have been measured at room temperature in 0.1M. KC1 solution. HD. 595. S. O. code no. 70-674-0-86. AERE C/R 813.

Emulsionen für die oberflächenbehandlung von werkstoffen (Emulsions for surface treatment of materials). I. G. Farbenindustrie A. G., Frankfurt am Main, Ger. Mar 1938. 7p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s5

Listed in BIOS FR 628, p. 103.
1. Emulsifying agents - Germany 2. Acronal L 100 (Trade name) 3. Acronal L 200 (Trade name) 4. Emulsion LAL 400 (Trade name) 5. Emulsion LAL 450 (Trade name) 6. Emulsion LM 1 (Trade name) 7. BIOS FR 826 LD 8. Micro BIOS DOCS 1932/609/6 9. Micro BIOS FD 525/47, Frames 134-140.

Low temperature polymeric compositions. Polaroid Corporation. Research Dept., Cambridge, Mass. Final report (period Jun 1, 1948-Nov 15, 1950) under Contract no. W44-109-qm-2007, by H. C. Haas. Nov 1950. 53p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108900

A report on research directed toward obtaining polymeric compositions which retain their strength and do not undergo brittle failure at temperatures down to -65°F is presented. The work was restricted to derivatives of cellulose studied mainly in the form of transparent films of a thickness between .010 and .030 inch. The generalized approach outlined at the beginning of the research was followed, and it is considered that the original objectives of this plan have been achieved.

Papers. Sep 1951. Conference on Quantum-Mechanical Methods in Valence Theory, Ram's Head Inn, Shelter Island, Long Island, N. Y., 1951.

Sep 1951. 294p photo, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $7.25. PB 111117

Conference held Sep 8-10, 1951 under the sponsorship of the National Academy of Sciences with the support of the Office of Naval Research. Robert S. Mulliken, Chairman. Contents: Summary by Robert G. Parr and Bryce L. Crawford, Jr.-1. Atomic term values and intervals, by C. W. Ufford.-2. On the polarizability of the hydrogen molecule, by Masao Kotani. - 3. Interaction of π-electrons in the acetylene molecule, by K. Hijikata, T. Nakamura, K. Ohno, and M. Kotani. - 4. On the distribution of charge in the CO bond of CO_2, by Harrison Shull. - 5. Transition probabilities III: Dipele velocity computations for C_2 and N_2+. The question of degree of hybridization, by Harrison Shull. - 6. Effect of variation of Z upon the theoretically computed energy levels of benzene, by Harrison Shull and Frank O. Ellison. - 7. Some comments on the London-Brooke treatment of diamagnetic anisotropy, by G. W. Wheland and Sheldon L. Matlow. - 8. Rotation around the Ph-Ph bond in diphenyl, by C. A. 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Intermolecular forces, by J. O. Hirschfelder. - 21. Intermolecular forces in helium, by H. Margenau. - 22. On a possible method for estimating the repulsive potential between closed shells, by H. Margenau and M. Karnaugh. - 23. Note on the calculation of exchange forces, by H. Margenau. - 24. Long range forces between large molecules, part I: Chain molecules, by C. A. Coulson and P. L. Davies. - 25. Interaction of electron donors and accepters, by Robert S. Mulliken. - 26. Intermolecular forces as revealed by line breadths in microwave spectra, by J. H. Van Vleck. - 27. Determinantal wave functions and magnetic problems, by J. C. Slater. - 28. Superposition of configurations: The helium atom, by G. Russell Taylor and Robert G. Parr. - 29. Chemical valence forces and binding energy calculations, by Charles P. Mueller and Henry Eyring. - 30. "Best orbital" for the hydrogen molecule, by Masao Kotani. - 31. Spatial correlation of electrons in atoms and molecules II, by J. E. 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Work on integrals at the Catholic University of America since 1949, by Karl F. Herzfeld and Virginia Griffing. - 43. Evaluation and tabulation of two-center integrals useful in calculations on molecular structure, by C. C. J. Roothaan and K. Rüdenberg. - 44. Report on the activities on the calculations of molecular integrals in Japan, by Masao Kotani. - 45. Report on a post-conference discussion on integrals held at the Hotel New Yorker, Sep 11, 1951, by Harrison Shull. - 46. Some comments on the methods for evaluating molecular integrals, by M. P. Barnett and C. A. Coulson. - 47. Austausch- und andere zweizentrenintegrale mit 2s- und 2p-funktionen, by Hermann-Josef Kopineck. - 48. Zweizentrenintegrale mit 2s- und 2p-funktionen II: Ionenintegrale, by Hermann-Josef Kopineck. - 49. Evaluation of unit molecular integrals, by C. A. Coulson and M. P. Barnett. - 50. On the calculation of certain integrals occurring in the theory of molecules, especially three-center and four-center integrals, by Stig O. Lundqvist and Per-Olov Löwdin. - 51. On the three- and four-center integrals in molecular quantum mechanics, by Klaus Rüdenberg. - 52. Bipolar expansion of coulombic potentials, by Robert J. Buehler and J. O. Hirschfolder. - 53. Method of estimating coulomb-exchange integrals over LCAO MO's in aromatic molecules, by Robert J. Parr.

Thermal properties of some simple fluorine compounds at low temperatures (HF, SF_6, SeF_6, TeF_6, NH_4F, AsF_3, CF_4, MnF_2, UF_4, UF_6, UO_2F_2, CaF_2, BaF_2, LiF, NaF, and KF), by C. Chou, C. W. Beckett, and H. L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, Ohio. Jun 1950. 36p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108751

The low temperature thermal properties of some simple fluorine compounds are reviewed, Thermal functions were calculated for solid and gaseous SF_6, solid MnF_2, solid and liquid AsF_3, solid BaF_2, and solid and liquid CF_4. Thermal functions for UF_4, UF_6, and $(UO_2)F_2$ in the solid state, were available in the literature and data are included in this report. There were insufficient data available in the literature to calculate thermal functions for solid HF, LiF, NaF, KF, CaF_2, and NH_4F as well as gaseous SeF_6 and TeF_6. Contract W33-038-ac-17721. Project 319.

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Intermolecular forces, by J. O. Hirschfelder. - 21. Intermolecular forces in helium, by H. Margenau. - 22. On a possible method for estimating the repulsive potential between closed shells, by H. Margenau and M. Karnaugh. - 23. Note on the calculation of exchange forces, by H. Margenau. - 24. Long range forces between large molecules, part I: Chain molecules, by C. A. Coulson and P. L. Davies. - 25. Interaction of electron donors and accepters, by Robert S. Mulliken. - 26. Intermolecular forces as revealed by line breadths in microwave spectra, by J. H. Van Vleck. - 27. Determinantal wave functions and magnetic problems, by J. C. Slater. - 28. Superposition of configurations: The helium atom, by G. Russell Taylor and Robert G. Parr. - 29. Chemical valence forces and binding energy calculations, by Charles P. Mueller and Henry Eyring. - 30. "Best orbital" for the hydrogen molecule, by Masao Kotani. - 31. Spatial correlation of electrons in atoms and molecules II, by J. E. Lennard-Jones. - 32. Comparative summary of approximate ground state wave functions of helium atom and hydrogen molecule, by Robert S. Mulliken. - 33. Investigation of the approximation of the method of the electron pair bond, with application to the water molecule, by Masao Kotani. - 34. On the electronic structure of the methyl radical CH_3, by Takashi and Kimio Ohno. - 35. Atoms in molecules and crystals, by William Moffitt. - 36. Remarks on self-consistent molecular orbitals, by J. C. Slater. - 37. Wave functions with IBM equipment, by Louis C. Green. - 38. On the methods of numerical intergration used in determining self-consistent fields, by Per-Olov Lowdin. - 39. Charge distributions of zero net charge, by J. E. Mayer. - 40. Use of the density matrix in calculations of interaction energies, by J. E. Mayer. - 41. Projects on molecular integral calculations at the Theoretical Chemistry Dept., Cambridge, by S. F. Boys. - 42. Work on integrals at the Catholic University of America since 1949, by Karl F. Herzfeld and Virginia Griffing. - 43. Evaluation and tabulation of two-center integrals useful in calculations on molecular structure, by C. C. J. Roothaan and K. Rüdenberg. - 44. Report on the activities on the calculations of molecular integrals in Japan, by Masao Kotani. - 45. Report on a post-conference discussion on integrals held at the Hotel New Yorker, Sep 11, 1951, by Harrison Shull. - 46. Some comments on the methods for evaluating molecular integrals, by M. P. Barnett and C. A. Coulson. - 47. Austausch- und andere zweizentrenintegrale mit 2s- und 2p-funktionen, by Hermann-Josef Kopineck. - 48. Zweizentrenintegrale mit 2s- und 2p-funktionen II: Ionenintegrale, by Hermann-Josef Kopineck. - 49. Evaluation of unit molecular integrals, by C. A. Coulson and M. P. Barnett. - 50. On the calculation of certain integrals occurring in the theory of molecules, especially three-center and four-center integrals, by Stig O. Lundqvist and Per-Olov Löwdin. - 51. On the three- and four-center integrals in molecular quantum mechanics, by Klaus Rüdenberg. - 52. Bipolar expansion of coulombic potentials, by Robert J. Buehler and J. O. Hirschfolder. - 53. Method of estimating coulomb-exchange integrals over LCAO MO's in aromatic molecules, by Robert J. Parr.

Thermal properties of some simple fluorine compounds at low temperatures (HF, SF_6, SeF_6, TeF_6, NH_4F, AsF_3, CF_4, MnF_2, UF_4, UF_6, UO_2F_2, CaF_2, BaF_2, LiF, NaF, and KF), by C. Chou, C. W. Beckett, and H. L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, Ohio. Jun 1950. 36p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108751

The low temperature thermal properties of some simple fluorine compounds are reviewed, Thermal functions were calculated for solid and gaseous SF_6, solid MnF_2, solid and liquid AsF_3, solid BaF_2, and solid and liquid CF_4. Thermal functions for UF_4, UF_6, and $(UO_2)F_2$ in the solid state, were available in the literature and data are included in this report. There were insufficient data available in the literature to calculate thermal functions for solid HF, LiF, NaF, KF, CaF_2, and NH_4F as well as gaseous SeF_6 and TeF_6. Contract W33-038-ac-17721. Project 319.

ELECTRICAL MACHINERY

Communication Equipment

Addition formulas for spherical wave functions, by W. S. Ament. U. S. Naval Research Laboratory. Sep 1948. 19p diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111140

The rectangular components of the three types of vector spherical wave functions are expressed in terms of the scalar spherical wave functions. Through these expressions and the known addition formula for an isotropic scalar spherical wave, addition formulas are derived in principle for all spherical scalar and vector waves. Specific expression is given component and addition formulas for scalar and vector wave functions corresponding to acoustic and electromagnetic waves scattered by particles small with respect to the wavelength. This paper is an extension of chapter VII of J. A. Stratton's Electromagnetic theory. NRL R3350.

Communications central AN/MSC-1. U. S. Army. May 1951. 118p photos, drawings, diagrs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 109082

1. AN/MSC-1 (Central station) 2. Telephones - Exchanges - Maintenance and repair 3. WD TM 11-5505.

Note on the long period variation in the radio frequency radiation from the quiet sun, by Takeo Hatanaka and Fumio Moriyama. Cornell University. School of Electrical Engineering, Ithaca, N. Y. Dec 1952. 14p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108306

The apparent temperature of the quiet sun measured at radio frequencies is calculated with varying value of the electron density in the corona and chromosphere to see how it changes throughout a sunspot cycle. The observations by Covington at 10.7 cm during 5 years seem to fit the calculated curve, while the decrement of the apparent temperature as given by Christiansen and Hindman on five frequencies between two periods seem not so well fitted, although the existence of a maximum of the variation of the apparent temperature at a frequency of about 1000 Mc/s is confirmed both from theory and observation. Scientific report no. 1 under Contract AF19 (604-73). Research report EE126.

Optics of microwave directive systems for wide-angle scanning, by A. S. Dunbar. U. S. Naval Research Laboratory. Sep 1948. 45p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 111138

Report on examination in detail of the optics of microwave directive systems from the standpoint of rapid-scanning antenna design. Optical aberrations of interest in microwave antenna design and their effects upon the diffraction pattern are investigated. Design of optically correct focusing devices is discussed and applications made to microwave design. NRL R3312.

Panel BD-132. U. S. Army. Jul 1949. 51p photos, drawings, diagrs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109079

1. BD-132 (Control panel) 2. Panels, Control - Maintenance and repair 3. WD TM 11-2064.

Radio receivers, R-108/GRC, R-109/GRC and R-110/GRC. U. S. Army. Mar 1951. 143p photos, diagrs (5 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 108867

Basic issue.
1. Radio receivers - Operation 2. Radio receivers - Maintenance and repair 3. R-108/GRC (Radio receiver) 4. R-109/GRC (Radio receiver) 5. R-110/GRC (Radio receiver) 6. WD TM 11-898.

Radio set AN/PRC-6 field maintenance. U. S. Army and U. S. Air Force. Jun 1952. 68p photos, diagrs, (2 fold), tables Available from Library of Congress Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108613

Basic issue.
1. Radio - Maintenance and repair 2. AN/PRC-6 (Radio set) 3. WD TM 11-4069 4. AAF TO 16-30PRC6-5.

Switchboard SB-53 ( )/FTC. U. S. Army. Jan 1950. 103p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109081

1. SB53 ( )/FTC (Telephone switchboard) 2. Telephones - Switchboards - Maintenance and repair 3. WD TM 11-2087.

Telephone switchboards SB-55/FTC and SB-55A/FTC (Fire reporting). U. S. Army. Nov 1949. 60p photos, diagrs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109080

1. SB-55/FTC (Telephone switchboard) 2. SB-55A/FTC (Telephone switchboard) 3. Telephones - Switchboards - Maintenance and repair 4. WD TM 11-2084.

Admittance of an open-ended coaxial line in an infinite ground plane, by Winston S. Lucke. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Jun 1950. 19p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108243

The terminal admittance of an open-ended coaxial line in an infinite ground plane is formulated in terms of integrals of the transverse electric field in the mouth of the line. The resultant expression for the admittance is in a variational form which yields results of usable accuracy for reasonable trial functions of the transverse electric field. Results are given for an assumed transverse field distribution of ρ^{-1}. Contract no. AF19(122)78. Technical report no. 11, SRI project no. 188.

Antenna pattern-measuring range, by John Taylor and Tetsu Morita. Harvard University. Cruft Laboratory. Apr 1951. 23p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108512

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Radiation patterns 2. Antennas - Radiation patterns - Measuring equipment 3. HU CL 122.

Circular apertures and their effects on half-dipole impedances, by Elmer O. Hartig. Harvard University. Cruft Laboratory. Jun 1950. 113p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108497

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas, Cylindrical - Impedance 2. Antennas, Cylindrical - Theory 3. Antennas, Cylindrical - Impedance - Measuring equipment 4. HU CL TR 107.

Development of isolators for heavy airborne electronic equipment. United States Rubber Co., Fort Wayne, Ind. Interim report no. 1, period July 1, 1952 to Nov 1, 1952, under Contract no. AF-33 (600)-20237, by H. H. Hile. Nov 1952. 31p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108315

1. Electronic equipment - Mountings, Shock.

Double-fed and coupled antennas, by C. T. Tai. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Feb 1950. 24p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108236

Several formulas have been derived for the imput impedance of a double-fed antenna, and the symmetric and antisymmetric impedances of two coupled antennas, collinear and broadside. It is demonstrated in the analysis of two broadside coupled antennas that the formulation can be applied to two antennas of arbitrary lengths, not necessarily equal. The limitation of the EMF method as applied to cylindrical antennas is pointed out. It is shown that Carter's treatment of two half-wave dipoles can be regarded as a special case of the present analysis of two coupled antennas, although the reactance terms of various impedance functions are slightly different because of the different theoretical models. Contract no. AF19(122)-78. Technical report no. 3, SRI project no. 188.

Effect of a grounded slab on the radiation from a line source, by C. T. Tai. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Jun 1950. 41p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108242

A theoretical investigation, based upon the method of Fourier transforms, is made of the effect of a grounded dielectric slab on the radiation from a line source. It is shown that the principal part of the electric field above the dielectric slab can be found either by evaluating the resultant contour integral using the saddle-point method of integration or by evaluating the integral containing the tangential H-field along the interface. The condition of the existence of propagating modes in the dielectric slab has been discussed in detail. Contract no. AF 19 (122)78. Technical report no. 9, SRI project no. 188.

Electric dipoles in the presence of elliptic and circular cylinders, by Winston S. Lucke. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Sanford, Calif. Sep 1949. 49p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108234

Contract no. AF 19 (122)-78. Technical report no. 1, SRI project no. 188.
1. Dipoles, Electric 2. Waves, Electromagnetic - Radiation 3. Equations, Electromagnetic 4. Green's function.

Evaluation of contacts. Mallory, P. R. and Co., Inc., Indianapolis, Ind. Under Contract no. AF 33(038)-11772.

Interim engineering report, period Jun 26, 1950 to Sep 26, 1950. Sep 1950. 49p drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108472

Detailed design of all the testing equipment is described. Detailed descriptions of the capsules are given along with the test results on capsules tested to dated. Report no. 100-M-2275 supplement "A".

Interim engineering report, period Sep 26, 1950 to Dec 26, 1950, by Stanton East and Frank Spayth. Dec 1950. 47p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108473

Electrical upsetting of contact rivets into arm and bracket along with use of a spring forming tool has cut assembly time by a factor of ten. "Production" testing has been well established. Tests have been run on Fine Silver, Copper, and Tungsten. Atmospheres used were Helium, Hydrogen and Air at 760 mm. pressure. Air at 760 mm. pressure has been chosen as the remaining atmosphere to compare tests with other data and to be used as a "standard". Report no. 100-M-2276 supplement "B".

Interim engineering report, period Dec 26, 1950 to Mar 26, 1951, by Stanton East and Frank Spayth. Mar 1951. 310p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $38.75. PB 108474

Tests are reported on each of the atmospheres under the eight different load conditions using the ten selected contact materials. In general, the results of these tests indicate that tungsten and molybdenum in preferably hydrogen and possibly helium will give excellent performance under D. C. loads. Under the alternating voltage high current load (30 amperes, 400 cycle) fine silver performed best. Report no. 100-M-2276 supplement "C".

Final engineering report, vol. I, by Frank Spayth and Stanton East. Jul 1951. 351p drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $45.00. PB 108475

Final tests under varying conditions are reported. Results of all the tests indicate that the selection of a contact material or atmosphere can only be made on the basis of the loads involved. The tests indicate that Hydrogen provides the best heavy current atmosphere and is better at high pressure. Wide variations are present at low currents as to atmosphere and pressure. Tungsten, Molybdenum and Silver-Cadmium Oxide are the best heavy current D. C. materials. Silver is the best material under heavy current A. C. loads. Wide variations in material are noted under the lower power loads. Report no. 100-M-2276 supplement "D", Vol. I.

Final engineering report, vol. II, by Frank Spayth and Stanton East. Jul 1951. 433p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $55.00. PB 108476

Experimental and theoretical discussion of the circular diffraction antenna, by Elmer O. Hartig. Harvard University. Cruft Laboratory. Jul 1950. 31p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108499

A theoretical study has been made of the admittance and radiation patterns of the circular diffraction antenna. This study has been facilitated by the introduction of fictitious magnetic and electric surface-charge densities. The admittance of this antenna has also been determined experimentally and a description is given of the special equipment and technique used. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 109.

Experimental investigation of recovery time of gases in microwave TR tubes. Sylvania Electric Products, Inc. Electronics Division, Boston, Mass. Final progress report on Contract no. W36-039-sc-44574 for period 15 Jun 1949 to 14 Jan 1951, by Lawrence J. Varnerin, Jr. Jun 1951. 39p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108600

CR31-555-25. Dept. of the Army project no. 3-19-03-032. Signal Corps project no. 27-3238-2. 1. Gases, Ionized - Dynamics 2. Hydrogen ion concentration 3. Plasma, Electron - Oscillations 4. Windows, Plastic 5. SIG Contract W36-039-sc-44574, Final report.

General purpose audio amplifier, by R. P. Lett. U. S. Naval Research Laboratory. Jan 1948. 13p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111128

The need for a good general purpose audio amplifier, especially for use in microwave testing of all kinds, has long been apparent. This paper outlines the main features that should be incorporated in such an amplifier, including detailed work on automatic normalization. NRL R 3219.

Impedance of an antenna over a large circular screen by James E. Storer. Harvard University. Cruft Laboratory. Nov 1950. 40p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108509

Contract N5ori-76, Task order no. 1, NR-078-011. 1. Antennas - Impedance - Theory 2. HU CL TR 119.

Improved methods of circuit construction, by R. O. Anderson. Minneapolis-Honeywell Regulator Co. Research Div., Minneapolis, Minn. Jul 1949. 11p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108319

Improved methods of wiring electronic equipment which offer reduced costs as well as the opportunity to build more reliable assemblies by high-volume production methods are described. The stamped wiring technique employs a single flat stamping or grid made of silver-plated brass which contains all connecting leads plus the necessary links to support the grid as one piece. After soldering the grid in

place, the supports are clipped away. Spraying copper into grooves on a bakelite chassis is also a satisfactory means of connecting electronic components. An all plug-in type of construction has been developed for quick replacement of potted groups of components. RD 1827-R3.

Improved theory of the receiving antenna, by Ronold King. Harvard University. Cruft Laboratory. Jun 1951. 39p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108520

The theory of the center-loaded receiving antenna is improved by introducing the expansion parameter of King and Middleton and generalized to take account of a load consisting of a two-wire line with finite spacing. First-order formulas for the distribution of current are obtained together with approximate second-order formulas for the complex effective length of the antenna. Theoretical results are compared with experiment. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 132.

Investigation of current distribution on asymmetrically-fed antennas by means of complementary slots, by Richard M. Hatch, Jr. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Feb 1950. 19p photos, drawing, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108240

This report describes apparatus used for investigation of current distributions on asymmetrically-fed cylindrical antennas. Two types of apparatus are discussed, one in which the oscillator is made small enough to be housed inside the antenna and another in which the complementary slot antenna is substituted in order to facilitate more accurate measurements. Curves showing distribution of the transverse E-field in the aperture of the slot antenna are presented for several cases of particular interest. Contract no. AF 19 (122)78. Technical report no. 7, SRI project no. 188.

Measurement of antenna impedance using a receiving antenna, by Donald G. Wilson and Ronold King. Harvard University. Cruft Laboratory. May 1948. 65p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108399

The fundamental purpose of this research was to develop and to utilize a method of measurement of antenna impedance through the use of a receiving antenna. The method was as follows: Energy from a remote transmitter was received by a specially constructed receiving antenna located above a large conducting plane and terminated in a slotted coaxial cavity. By the "resonance-curve" method, from measurements of resonant lengths and meter deflections associated with this cavity, the combined phase and damping functions for the two ends of the cavity were determined. In effect, the receiving antenna constituted the generator for the coaxial line, and the impedance of this generator was measured. Curves of impedance as a function of the length of the antenna were obtained for several different antennas. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 43.

Measurement of current and charge distributions on cylindrical antennas, by T. Morita. Harvard University. Cruft Laboratory. Feb 1949. 121p photos, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 108459

A method is described by which the perturbation of the field due to the probe cable is eliminated by inserting the cable inside the antenna with the probe projecting from a slot on the antenna. This technique is not limited to the simple dipole but is applicable to many other antenna structures which may be used over a ground plane. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 66.

Measurement of low-frequency aircraft antennas properties using electrostatic techniques, by J. T. Bolljahn. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Sep 1951. 21p photo, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108251

This report describes a system which has been developed for measuring the properties of low-frequency aircraft antennas. Scale models of the aircraft and antennas of interest are used. The basic procedure differs from that used in the more familiar model measurements, however, since the source of excitation of the model is a confined electrostatic field rather than an electromagnetic wave. Measurements of absolute sensitivity as well as radiation patterns may be made. Typical experimental results are shown. Contract no. AF19(122) 78. Technical report no. 19, SRI project no. 188.

Methods of measuring the properties of ionized gases at high frequencies. III: Measurement of discharge admittance and electron density, by Sanborn C. Brown and David J. Rose. Massachusetts Institute of Technology. Research Laboratory of Electronics. May 1952. 10p diagrs, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108662

Contract no. DA36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102 B-O.
1. Gases, Ionized - Properties - Measurement
2. Gases, Ionized - Electron density - Measurement
3. Electrons - Discharge 4. MIT RLE TR 230.

Microwave Q measurements in the presence of series losses, by L. Malter and G. R. Brewer. U. S. Naval Research Laboratory. May 1948. 17p

diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111124

Presence of series losses in microwave circuits is indicated by impedance measurements using standing wave machine techniques, in that VSWR far from resonance is no longer infinite. Unless series losses are negligible, the internal or unloaded Q (Qo) cannot be considered as a constant independent of coupling. NRL R 3205.

Millimeter wave research: Components for millimeter wavelength range, by Harold Herman and Robert J. Coates. U. S. Naval Research Laboratory. Jan 1948. 17p photos, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111123

1. Wave guides - Components 2. NRL R3223.

Modulation, generation and frequency multiplication of microwave oscillations by a spiral beam of electrons, II, by F. K. Willenbrock. Harvard University. Cruft Laboratory. Apr 1951. 34p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108500

An experimental investigation has been made of the interaction of a spiral beam of electrons and a cylindrical cavity oscillating in the TE_{111} mode in the presence of a steady axial magnetic field. Measurements were made on the spiral-beam coupling between the two mutually perpendicular modes of oscillation of the cavity as a function of the magnetic field strength and the beam voltage and current. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 110.

On the theory of random noise-phenomenological models, by D. Middleton. Harvard University. Cruft Laboratory. Oct 1950. 61p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108501

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Noise, Random - Theory 2. HU CL TR 111.

Problems of measurement on two-wire lines with application to antenna impedance, by Kiyo Tomiyasu. Harvard University. Cruft Laboratory. Jun 1948. 149p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 108403

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Impedance - Measurement 2. Voltage - Measurements 3. Detectors, Standing - Wave 4. Circuits - Balancing 5. HU CL TR 48.

Prolate spheroidal wave functions, by Carson Flammer. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Feb 1951. 60p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108248

Prolate spheroidal wave functions are those solutions of the scalar Helmholtz equation in prolate spheroidal coordinates which are appropriate to exterior boundary value problems. This report presents a comprehensive treatment of these functions by unifying and extending the work of various authors. Contract no. AF19(122)78. Technical report no. 16, SRI project no. 188.

Radar response from thin wires, by C. T. Tai. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Mar 1951. 35p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108250

The problem of radar response or electromagnetic back-scattering from thin wires has been investigated using a variational formulation. The relation between the variational method and the induced EMF method of Van Vleck, Bloch and Hamermesh is discussed. Various types of trial functions have been used for the case of broadside incidence to demonstrate the flexibility of the variational calculation in obtaining the numerical result. The "boundary condition" by which currents at the ends of the wire are made to vanish is also carefully examined. Contract no. AF19(122)78. Technical report no. 18, SRI project no. 188.

Radiation fields of helical antennas, by Arthur E. Marston. U. S. Naval Research Laboratory. Sep 1948. 17p diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111137

Radiation fields of helices energized by a traveling wave of current are explicitly evaluated in terms of a rapidly converging series of Bessel functions. This evaluation leads to design criterion for helix whose radiation pattern is endfire and whose field polarization on axis is circular. Radiation fields of multiple helices are also analyzed. NRL R3357.

Radiation pattern of an antenna over a circular ground screen, by James E. Storer. Harvard University. Cruft Laboratory. Jun 1951. 25p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108516

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Radiation patterns 2. Screens, Electromagnetic 3. HU CL TR 126.

Reflections of electromagnetic waves of continuously variable refractive index, by Donald M. Swingle. Harvard University. Cruft Laboratory. Jul 1950. 16p diagrs, graph Available from Library of Congress, Publication Board Project, Washington

25, D. C. Microfilm $1.75, Photostat $2.50.
PB 108502

It is shown theoretically that the reflection of a plane wave, normally incident on a plane surface across which the gradient of refractive index is discontinuous, has the form of a time integral of the incident wave. This is obtained as a generalization of simple Fresnel reflection from a dielectric interface under the restriction that the total change of refractive index must be small. Contract N5ori-76, Task order no. 28, NR-071-011. HU CL TR 112.

Self-and mutual impedances of parallel identical antennas, by Ronold King. Harvard University. Cruft Laboratory. Nov 1950. 64p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108508

A method is described for obtaining approximate second-order self-and mutual impedances of parallel identical antennas. Extensive tables and curves of the newly determined impedances are provided. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 118.

Shunt-excited flat-plate antennas with applications to aircraft structures, by J.V.N. Granger. Harvard University. Cruft Laboratory. Apr 1949. 31p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00.
PB 108354

The electrical characteristics of the shunt-excited flat-plate antennas, which resemble folded dipoles except for the distortion of the cross section of the unbroken conductor into a thin rectangle, are examined experimentally and in terms of a simplified mechanism by means of which their characteristics can be predicted in a qualitative manner. The effect on these characteristics of the various important geometrical parameters is illustrated by experimental data, and shown to conform to the predicted behavior. Two ways in which this structure may be used as the basis for low-drag antennas for high-speed aircraft are discussed in some detail. Contract N5ori-76, Task order no. 1. HU CL TR 70.

Small dipole-type antennas, by J. T. Bolljahn. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Sep 1950. 48p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108246

This report is concerned with the properties of small antennas of the dipole type. The development proceeds from the receiving antenna point of view. The advantage of an equivalent current-generator circuit over the equivalent voltage-generator circuit is discussed, and a sensitivity parameter based on the current-generator circuit is defined. Other topics included are the evaluation of sensitivity parameters for antennas of various geometrical forms, the consideration of ground-plane effects, the interpretation of the sensitivity parameter in terms of transmitting properties, and systems considerations. Contract no. AF19(122)78. Technical report no. 14, SRI project no. 188.

Surface current and charge measurements on flat metal sheets, by Donald K. Reynolds. Harvard University. Cruft Laboratory. Aug 1948. 127p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25.
PB 108411

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Impedance - Measurement 2. Antennas - Current distribution - Measurement 3. Probes, Electromagnetic - Design 4. HU CL TR 53.

Theory of impulse breakdown, by F. R. Dickey, Jr. Harvard University. Cruft Laboratory. Dec 1951. 20p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108514

The experiments performed by R. C. Fletcher on impulse breakdown in air, and his theory of the time lag of impulse breakdown are reviewed. A new theory is developed on the assumption that the breakdown consists primarily of ionization in a uniform field. This theory permits calculation of the general features of the breakdown transients observed by Fletcher. The theory also indicates that direct measurement of the mean ionizing time for an electron in the gap should be possible with Fletcher's apparatus. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 124.

Thermionic emission of various materials. Battelle Memorial Institute, Columbus, Ohio. Summary report, Nov 15, 1948 to Nov 14, 1951, under Contract no. W-36-039-sc-38185, by E. N. Wyler, E. M. Baroody, and F. C. Todd. Nov 1951. 111p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108488

Dept. of the Army project no. 3-99-13-022. Signal Corps project no. 27-112 B-O. Appendix I: Present status of secondary-emission theory, by E. M. Baroody.
1. Thermionic emissions 2. Thermionic emissions - Measuring equipment 3. Electrons - Emission, Secondary - Measurement 4. Electrons - Emission, Secondary - Measuring equipment 5. Electrons - Emission, Secondary - Theory 6. Cathodes, Oxide - Emission 7. Earths, Rare - Emissions.

Ultrahigh-frequency antenna considerations for radiation measurements, by Harold E. Dinger and George E. Leavitt. U. S. Naval Research Laboratory. Dec 1947. 22p drawings, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75.
PB 111127

Theoretical and practical antenna design considerations are discussed with respect to ultrahigh-frequency field-intensity measurements, with special emphasis on half-wave dipoles, horns, and corner reflectors. Two design examples are given for use in electronic heating applications. NRL R3210.

Use of complementary slots in aircraft antenna impedance measurements, by J. T. Bolljahn. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Feb 1950. 19p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108238

This report describes a method for eliminating the feed-cable effect in the measurement of aircraft wing-cap and tail-cap antenna impedances with the aid of models. The procedure employed allows greater accuracy in measurement than that obtainable with conventional techniques, but its application is restricted to use on simplified models. The advantages and limitations of the method are discussed, and typical experimental results are presented. Contract no. AF19(122)78. Technical report no. 5, SRI project no. 188.

Wide-band square-law computing amplifier, by A. S. Soltes. U. S. Air Force. Electronics Research Division, Cambridge Research Center, Cambridge, Mass. Nov 1952. 13p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108291

Wide-band computing amplifiers capable of accurately and continuously yielding output signals with amplitudes proportional to the mathematical square of their input amplitudes have been developed. These computers are designed to be inserted in signal channels in much the same manner as conventional amplifiers, but impart thereto a square-law transfer characteristics. Details are given concerning a model that provides an accuracy of the order of 1 percent of full scale over an output dynamic range of 40 db when operating on fractional microsecond, pulsed carrier, signals. AAF CRL E 5092.

Wing-cap and tail-cap aircraft antennas, by John V. N. Granger. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Mar 1950. 103p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108239

This report describes the electrical characteristics of wing-cap and tail-cap structures as aircraft antennas for MHF. The properties of the asymmetrically-driven dipole are outlined, and the relationship of this antenna to the wing-cap and tail-cap structures is discussed qualitatively. The impedance properties of these antennas, as determined by analysis and extensive measurements on complementary slot structures are given. Also discussed are: the use, in this application, of the concept of the equivalent radius of a cylindrical antenna; the definition and use of complementary slots, and the effect of base capacitance. Contract no. AF19(122)78. Technical report no. 6, SRI project no. 188.

Generators, Motors, Transmission

Simple inverting transformer for millimicrosecond pulses, an A.E.R.E. report, by I.A.D. Lewis and H. C. Whitby. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Nov 1951. 17p photos, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108727

Details are given of two similar types of transformer which may be used for the inversion, with a small loss in amplitude, of millimicrosecond pulses. Pulse rise times of less than 2 mμ sec. are obtained and very large amplitudes can be handled with complete linearity. HD 597. S. O. code number is omitted. AERE G/R 751.

Miscellaneous

Finite difference solution of recurrent networks, by Burton N. Navid. U. S. Naval Research Laboratory. Mar 1948. 12p diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111133

Study of several ladder-type networks, uniform and otherwise where recursion formulas for system determinants are obtained which are then solved by method of finite differences. Broad class of networks seem amenable to this analysis. NRL R 3244.

Obtaining the voltage-standing-wave ratio on transmission lines independently of the detector characteristics, by A. M. Winzemer. U. S. Naval Research Laboratory. Jul 1948. 28p diagrs, graphs, fold table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111139

By means of basic transmission-line equations and the general law of detection, expressions are derived which give the voltage-standing-wave ratio as a function of measurable electrical angles, the expressions being independent of the response law of the detector. Special cases are discussed and the extension of the methods to the case of attenuating transmission lines is given. NRL R 3314.

Resistance-capacitance shunted high-pass network synthesis, by Charles F. White. U. S. Naval Research Laboratory. Jan 1953. 19p diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111108

Procedures are given for the direct synthesis of resistance-capacitance shunted high-pass two-section (and single-section) networks having transfer char-

acteristics with poles and zeros located precisely at the required corner frequencies. Network parameter values are given for designs that display the range of network responses possible. An illustration is given in which the network is used in the equalization of an amplidyne servo system. NRL R 4100.

FOOD AND KINDRED PRODUCTS

Arctic survival rations, by Kaare Rodahl, Charles R. Shaw, Horace F. Drury. U. S. Air Force. Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska. Dec 1952. 90p photos, map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108714

1. Food rations, Survival 2. Survival, Arctic 3. AAF AAL Proj 22-1101-0002, Report no. 1.

Survival rations at sea. Pittsburgh. University, Pittsburgh, Pa. Interim report under Contract OEMcmr-261, by E. M. Scott. Jul 1945. 65p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108758

1. Food rations, Survival 2. CMR 261.

FUELS AND LUBRICANTS

Biological deterioration and degradation of hydrocarbons, by Elias L. Margolin. Pittsburgh. University, Pittsburgh, Pa. Jun 1951. 33p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108763

A study of the biological degradation of the hydrocarbons found in fuel, oil, additives, and corrosion-preventive compounds were performed. There was a definite correlation between the results of tests with individual molds in flasks and those recorded for the tropical testing technique. Isocompounds were more susceptible to attack than straight chain compounds. It is concluded that the effects of attack as observed on this project were not of sufficient magnitude to affect adversely the performance of the materials in service. Contract no. W33(038)-ac-15839. AAF TR 6290.

Castor oil-tolylene diisocyanate polyurethane as impregnating, encapsulating and potting compound, by V. Ciola, S. Bonotto, G. Cassias, and N. Vasileff. Princeton University. Plastics Laboratory. Jun 1951. 29p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108916

The best compound of those tested was one made of castor oil, tolyene diisocyanate, and 2-ethyl hexanediol-1,3, with or without catalyst. A major difficulty was in preparing bubble-free resins. The investigation has shown that the bubble problem can be eliminated by partially prereacting the resin prior to potting. One important feature is that there is no flow at high temperatures, and electrical and mechanical properties of sample disks after 1000 hours at 125° are promising. Contract report no. 3 B on Contract no. DA36-039-sc-133. Dept. of the Army project: 3-99-15-022. Signal Corps project: 32-152B-O. PU PL TR 21B.

Lacktechnischen eigenschaften der urethanleinöle (Technological properties of Urethane linseed oils used in varhishes), by Dr. Droste. Sep 1941. 13p graphs, tables Available from Library of Congress Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 99911s3

Listed in BIOS FR 628, p. 103.
1. Linseed oils - Germany 2. Urethane oils - Germany 3. BIOS FD 628 LD.

Low temperature lubricating oil additives, by Donald Grabar, Geraldine Corcoran, and Glen W. Hedrick. Armour Research Foundation, Chicago, Ill. Dec 1949. 64p photos, graphs, fold table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108853

Progress made in a study of low-temperature lubricating-oil additives is reported. Laboratory work included extraction of the wax from the oil, analysis of commercial additives, an investigation of the effectiveness of additives, the synthesis of pure waxes and additives, and microscopic and crystallographic studies. Contract AF33(038)-1644. ARF Proj. 90-691C, Report no. 12.

Performance studies of experimental aviation fuels employing high anti-knock blend agents, by A. H. Fox and C. H. McDonnell. Standard Oil Co. of Indiana. Research Dept. Whiting Laboratory, Whiting, Ind. Apr 1950. 8p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108715

Comparative knock-limited data for two aviation gasolines employing high antiknock blend agents are presented. The evaluation was obtained in a 17.6 engine, over a range of inlet air temperatures, at 5.6:1 and 7.0:1 compression ratios. At a fuel ratio of 0.070, the high aromatic fuel (blend 2A) permitted an increase in IMEP with the higher compression ratio for each inlet air temperature investigated except 100°F, where its performance was approximately equivalent to the lower compression ratio. The lower aromatic content fuel (blend 2) resulted in a decrease in IMEP with the higher compression ratio for all inlet temperatures. The IMEP decrease was greater as inlet air temperatures increased. Report no. 7 under Contract no. W33-038-ac-22581. For 1st report see PB 97755.

Referat für die 33. sitzung der Lack-Kommission am 29. Sep 1941 in Ludwigshafen. Urethan-leinöle Report for the 33rd meeting of the Varnish Committee held on Sep 29, 1941 in Ludwigshafen. Urethane linseed oils), by Dr. Bunge. Sep 1941. 8p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 99911s2

Listed in BIOS FR 628, p. 103.
1. Urethane oils - Germany 2. Linseed oils - Germany 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/3 5. Micro BIOS FD 525/47, Frames 113-125.

Uebergang der reibungswärme von lagern aus der schmierschicht in die gleitflächen. (The transfer of frictional heat of bearings from the lubricating film into the frictional surfaces. Temperature distribution and the heat generation curve in parallel lubricating films during heating by internal friction), Georg Vogelpohl. Feb 1953. 97p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 108822

Translation from Verein Deutscher Ingenieure - Forschungsheft 425. Supplement to "Forschung auf dem Gebiete des Ingenieurwesens", Issue B, Vol. 16, July-August 1949.
1. Lubrication - Theory - Germany 2. Bearings, Friction - Lubrication - Germany 3. Heat - Transference - Theory - Germany 4. Friction - Theory - Germany 5. Surfaces, Contact - Lubrication - Germany 6. Verein Deutscher Ingenieure, Berlin 7. NAVSHIPS T 515 8. STS-164.

Versuche über den acetylenzerfall (Tests on the decomposition of acetylene), by Dr. Weissweiler. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1940-1944. 51f photos, graph, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Enlargement Print $8.75. PB 91664s

Listed in BIOS FR 1162 p. 32. These are the original documents which were translated to make up BIOS FR 1162. See also PB 18852s14 and 18852s14t. Second item illegible. Also contains: Bericht über die besprechung am 10 Dez. 1940 in Ludwigshafen/Rh betr. acetylenzerfall (Report on the conference on Dec 10, 1940 in Ludwigshafen on the decomposition of acetylene) by Dr. Weissweiler, Jan 1941. - Acetylenzerfallsversuche in Griesheim (Tests at Griesheim on decomposition of acetylene), by Dr. Weissweiler, Jun 6, 1941. - Über die sicherung gegen den detonations-artigen acetylenzerfall in langen leitungen (Prevention of detonation-lide decomposition of acetylene in long lines) by Dr. Weissweiler, 1944. - Messungen zur klärung einer frage in referat von Herrn Dr. Weissweiler (Clarification of a question in Dr. Weissweiler's report) by Dr. Witte.
1. Micro BIOS/DOCS/1460/3257 2. Micro BIOS FD 230/48, Frames 1-51.

HIGHWAYS AND BRIDGES

Compaction of embankments, subgrades and bases. Highway Research Board. Committee on Compaction of Subgrades and Embankments. 1952. 92p photos, map, graphs, tables Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.50. PB 108649

This publication presents the fundamental principles of compaction and also how compaction is used in design and construction of roads. Requirements are discussed in the light of practicable and economical limits of field compaction. The text discusses not only selection of rolling equipment but also the use of auxiliary equipment. Field control of compaction is discussed in some detail. Presents tabulated data on manufacturers specifications for compaction equipment. L. D. Hicks Chairman. National Research Council. Publication 240. HRB Bul 58.

Connecticut highway maintenance production study, conducted jointly by the Connecticut State Highway Department and the Bureau of Public Roads, Department of Commerce, by Fred B. Farrell. Highway Research Board. 1952. 241p photos, maps (1 fold), fold graphs, tables Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. PB 108470

1. Roads - Maintenance and repair 2. Roads - Construction - Costs 3. Roads - Surface treatment - Maintenance and repair 4. HRB SR8.

Curing of concrete pavements, revised edition. Highway Research Board. Oct 1952. 19p Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $.30. PB 108381

Current Road Problems no. 1-R. Appendices include standard specifications for cotton mats, burlap, etc. and selected bibliography.
1. Pavements, Concrete - Curing 2. HRB CRP 1-R.

Distribution of load stresses in highway bridges, presented at the 31st annual meeting Jan 1952. Highway Research Board. 1952. 92p photos, diagrs, graphs, tables Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $1.50. PB 108954

Contents: Effect of trucks upon a few bridge floors in Iowa in 1922 and in 1948, by Almon H. Fuller. - Test on rolled-beam bridge using H20-S16 loading, by G. M. Foster. - Load distribution between girders on San Leandro Creek bridge, by T. Y. Lin and

R. Horonjeff. - Load distribution on highway bridges having adequate transverse diaphragms, by G. S. Paxson. - Distribution of loads to girders in slab-and-girder birdges: Theoretical analyses and their relation to field tests, by C. P. Siess and A. S. Veletsos. - Reactions of a two-span, skewed, rigid-frame bridge, by Gordon P. Fisher and Walter C. Boyer. HRB RR 14-B. NRC 253.

Proceedings of the thirty-first annual meeting, Washington, D. C., Jan 15-18, 1952. Editors: Fred Burggraf, W. N. Carey, Jr., Walter J. Miller. U. S. Highway Research Board. 1952. 716p photos, drawings, maps, graphs, tables Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $7.50 plus 30¢ foreign postage. PB 108407

National Research Council publication 238.
1. Roads - Research 2. Roads - Construction 3. Roads - Maintenance and repair 4. Roads materials - Research 5. Soils (Engineering) 6. Traffic - Research 7. NRC 238.

Provning av betongbeläggningar och formassa (Testing of concrete pavements and asphalt compounds for sealing of joints), by Per Olov Jonsson. Sweden. Statens Provningsanstalt, Stockholm. 1951. 15p photos, diagrs, graphs (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108361

Summary in English.
1. Pavements, Concrete - Joints - Tests - Sweden 2. Compounds, Sealing - Tests - Sweden 3. Sweden. Statens Provningsanstalt, Stockholm. Meddelande 107.

INSTRUMENTS

Carbon dioxide analyzer, by Allan C. Young. U. S. Air Force. Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska. Dec 1952. 10p photo, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108712

Contract AF 33 (038)-422.
1. Gas analyzers - Design 2. Instruments, Gas analysis - Carbon dioxide 3. Carbon dioxide - Analysis 4. AAF AAL Proj 22-1301-002.

Computer components fellowship no. 347. Quarterly report no. 3, Apr 11-July 11, 1951, under Contract no. CLN AF19/122/-376, by J. R. Bowman, F. A. Schwertz, B. Moffat, R. Steinback and Byron O. Marshall, Jr. Mellon Institute of Industrial Research, Pittsburgh, Pa. Jul 1951. 96p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 108646

1. Computers, Digital - Components 2. Computers, Digital - Design 3. Networks, Cartesian - Theory 4. Resistors, Nonlinear - Use in digital computers.

Design of mass flowmeters for large flows: flow-shunts, an A.E.R.E. report, by H. Kronberger. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 13p photo, drawing, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108728

A flowmeter is described which has a range up to about 6 kg of hydrogen per hour (about 70,000 litres hr) on a scale linear to $\frac{1}{2}\%$. The instrument consists of a standard mass-flowmeter as described in report Br.556, and a flow-shunt in parallel, the branching ratio being of the order of 100,000. Design rules for shunts of constant branching ratio are given. HD 571. S. O. code number is omitted. AERE G/R 784.

Electronic error integrator, by Henry P. Birmingham. U. S. Naval Research Laboratory. Jun 1948. 11p photo, diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111122

Description of device designed to provide accurate, easily obtainable measures of average tracking error. Instrument, which is intended primarily for laboratory use in evaluating tracking performance, can be connected directly to any tracking equipment, trainer or simulator where error is available as d-c voltage. NRL R 3297.

Evaluation of the eye refractometer, by Mathew R. Wilson. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Dec 1952. 9p photo, drawing, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108663

The Rodenstock "Eye Refractometer" is comparable in accuracy to the standard methods of retinoscopy in determining refractive errors under cycloplegia. The eye refractometer provides a method for accurate cycloplegic refracting at a great saving in time to the relatively inexperienced refractionist and can be accurately employed by the totally inexperienced technician after a few hours' indoctrination. AAF SAM Proj. 21-0201-0007.

Gage for the measurement of transient hydraulic pressures, by E. F. Rice. Oregon. Engineering Experiment Station, Corvallis, Oregon. Oct 1952. 27p photos, drawing, graphs, tables Available from Engineering Experiment Station, Oregon State College, Corvallis, Ore. $.40. PB 108674

1. Hydraulic pressure - Measurement 2. Gages - Design 3. O EES B32.

METALS AND METAL PRODUCTS

Chemical surface treatment of titanium. Battelle Memorial Institute, Columbus, Ohio. Interim technical report under Contract no. DA-33-019-ORD-215, May 23, 1951 to Jan 31, 1952, by H. A. Pray, Paul D. Miller and R. L. Gibbs. Mar 1952. 52p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50.
PB 108891

The present project was set up to investigate the production of coatings on various titanium alloys by chemical and electrochemical methods. Titanium shows a definite tendency to seize and gall during forming operations. The work during the period covered has been concerned with the testing of various aqueous solutions which, on the basis of present knowledge, form coatings on some metals or, because of the chemistry involved, could form coatings on titanium. The results are discussed in detail. O. O. Project no. TB4-15. WALR 401/45-10.

Effect of range of stress and state of stress on the fatigue strength of SAE 4340 steel, by B.C. Hanley. Illinois. University. Dept. of Theoretical and Applied Mechanics, Urbana, Ill. Feb 1951. 52p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50.
PB 108384

Groups of unnotched specimens were subjected to five different states of stress by means of fatigue tests involving: (a) bending, (b) torsion, and (c) three different combinations of bending and torsion. For each state of stress the mean stress was varied to include five different values ranging from zero to the maximum value that the specimen could sustain. The tests were conducted in modified "plate-bending" machines specially adapted to these experiments. An analysis of the 25 S-N curves obtained indicated that the endurance limit, as measured by the alternating stress amplitude, was practically independent of the value of the mean stress superimposed for the various combinations of bending and torsion investigated. Technical report no. 22 on "Behavior of metals under repeated stress." Contract N6ori-71, T. O. IV, Project NR-031-005. ILU EES TR22.

Effect of titanium and vanadium on the mechanical properties and weldability of experimental low-alloy high-tensile steel, by George G. Luther, Carl E. Hartbower and Donald B. Roach. U. S. Naval Research Laboratory. Nov 1948. 42p photos, diagr, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.25. PB 111135

Tensile properties, maximum underbead hardness, underbead cracking, weldability according to the nick-bend specimen, and notch sensitivity as determined by V-notch Charpy bar were the means of evaluating the relative performance of steels in both the as-rolled and normalized conditions. Investigation showed that small variations in amount of titanium or vanadium produced a marked effect on the temperature of transition from ductile to brittle behavior. NRL M3343.

Effect of prestraining on the strength of aluminum alloy struts, by C. Gurney and S. Pearson. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Sep 1949. 13p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108774

The effect of prestraining, after age hardening, on the strength of pin-ended struts of aluminum alloy was investigated. The material was solution heat-treated and aged after machining. Some of the material was tested in this condition, some after straining (4%), and a third batch after straining 4% followed by a low-temperature heat-treatment to remove the Bauschinger effect. It was concluded that the straining improved the strut strength and the heat-treatment was successful in eliminating the Bauschinger effect. Report no. MET. 43. R.A.E. Ref: M.1010 3/8/55.

Field service in the welding of high-strength structural steel and in the repair welding of cast armor (OD-36-2) Advisory report, by E. J. Zoog. National Research Council. War Metallurgy Committee. Feb 1946. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 108373

Contract OEMsr-307.
1. Steel, Structural - Welding 2. Armor plate - Repair 3. Armor plate - Welding 4. WMC M-645 5. OSRD 6594.

Germanium crystal rectifiers. U. S. Office of Technical Services. Feb 1953. 5p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25.
PB 111120

1. Rectifiers, Germanium - Bibliography 2. OTS IR 9957.

Germanium production from zinc residues. U. S. Office of Technical Services. Feb 1953. 12p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25.
PB 111119

1. Germanium - Production 2. Germanium - Bibliography 3. Zinc ores - Germanium recovery 4. OTS IR 9932.

Indexing of Division 18 NDRC reports. National Research Council. War Metallurgy Committee. Contract OEMsr-307.

On cast and rolled armor. Advisory report by Helen L. Purdum. Feb 1946. 102p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108454

1. WMC M-646 2. OSRD 6595.

Reports on aluminum alloys issued during the period Jan 1943-Feb 1944. Progress report by Ralph H. Phelps and Helen L. Purdum. May 1944. 21p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108365

1. WMC M-247 2. OSRD 3697.

Reports on magnesium alloys issued during 1942 and 1943. Progress report by Ralph H. Phelps and Helen L. Purdum. Mar 1944. 28p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108364

1. WMC M-211 2. OSRD 3435.

Reports on the welding of armor plate, ordnance and structural steels issued during the period 1942-1944. Progress report by Ralph H. Phelps and Helen L. Purdum. May 1945. 65p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108451

1. WMC M-481 2. OSRD 5047.

Influence of variations in boron, carbon and manganese contents on some properties of steels for armor plate and other military applications. U. S. National Bureau of Standards. Progress report on investigation of boron in armor plate (OD-87), by Thomas G. Digges. Jan 1943. 37p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108404

NDRC research project NRC-31. Contract symbol no. 1720.
1. Armor plate - Boron content 2. Armor plate - Carbon content 3. Armor plate - Manganese content 4. Steel alloys - Tests 5. WMC M-34 6. OSRD 1159.

Investigation of boron in armor plate. U. S. National Bureau of Standards. NDRC research project NRC-31. Contract symbol no. 1720.

Influence of boron and nickel on some properties of experimental steels containing 0.3 per cent carbon and 0.8 per cent manganese (OD-87), by T. G. Digges. Sep 1943. 34p graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108360

Tests were made to determine the influence of boron on the workability, structure, critical points, austenite and McQuaid-Ehn grain sizes, hardenability, hardness, notch toughness at room and low temperatures, and tensile properties of experimental steels containing 0.3 percent carbon, 0.8 percent manganese, 0.25 percent silicon and varying amounts of nickel. The boron content of the steels ranged from approximately 0 to 0.006 percent with nickel from 0 to 1.1 percent. The grain size at the temperature used for hardening and normalizing tended to increase with boron in the steels without nickel whereas the addition of nickel was effective in preventing coarsening at these temperatures in the steels with 0.0015 to 0.003 percent boron. Progress report Mar 5-Aug 14, 1943.

Influence of nitrogen on some properties of experimental steels without and with boron, by T. G. Digges and F. M. Reinhart. Mar 1944. 60p photos, graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108377

Tests were made to determine the effect of nitrogen on the workability, structure, critical points, austenite and McQuaid-Ehn grain sizes, hardenability, notch toughness (Charpy impact) at room and low temperatures, hardness and tensile properties of experimental steels without and with boron additions. Heats were prepared with 0.30 percent carbon, 1.6 percent manganese, 0.25 percent silicon and 0.005 to 0.030 percent nitrogen with 0.0015 and 0.0030 percent boron without and with 0.2 percent titanium. Heats were also prepared with high nitrogen and 0.0015 percent boron (with ferroboron) and varying amounts of titanium, zirconium, and chromium without and with titanium. Determinations for nitrogen were made by either the vacuum fusion or modified Allen method or by both, and for boron by a distillation-colorimetric method. Progress report, Aug 12, 1943-Feb 17, 1944.

Investigation of the performance of tungsten-cobalt plated slip rings and commutators, by Billy M. Horton. U. S. Naval Research Laboratory. Dec 1947. 15p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111129

An electroplated alloy of tungsten and cobalt on copper has been given limited tests under sea level and simulated high-altitude conditions. The first series of tests, made with a slip ring and a dummy commutator under conditions of low temperature, humidity, and pressure, gave results which were favorable when compared to results on copper. Further tests of an actual aircraft generator at sea level have given unsatisfactory results to date. Mechanical difficulties may have contributed to this poor operation. NRL E 3211.

Investigation of welded H-plates from the 1942-1943 Canadian cold test, part II: H-plates manually welded with austenitic Cr-Ni-Mn electrodes. International Nickel Co., Inc. Research Laboratory, Bayonne, N. J. Progress report on weldability of commercial armor plate (OD-82), by A. P. Gagnebin and L. L. Seigle (with foreword and appendix from U. S. Steel Corporation Research Laboratory). Jun 1944. 43p photos, graphs, table

(part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108406

The primary cause for the high proportion of low-temperature ballistic failures in the H-plates welded manually with austenitic Cr-Ni-Mn electrodes is believed to be the excessive hardness in the weld metal at the root resulting from insufficient alloy content of the deposited metal because of excessive dilution by the base metal. Other factors, which contributed to the poor ballistic record are cracks and other faults, particularly in the root zone. Recommendations are made for the improvement of the ballistic shock quality of armor manually welded with austenitic Cr-Ni-Mn electrodes. Report no. Case report 4082.2. NDRC research project NRC-1. Contract OEMsr-552. Part 1 issued as OSRD 3514 (PB 108396); part 3 issued as OSRD 4165 (PB 108370). WMC M-298. OSRD 3819.

Manufacturing techniques-magnesium alloy propellers. Hartzell Propeller Co., Piqua, Ohio. Engineering report under Contract AF33(038)-8877, by David Biermann. Jun 1951. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108548

Manufacturing of magnesium blades offers no inherent problems. For small runs, blades should be carved from ZK-60 extrusions; for large runs, from ZK-60 press forgings when adequate press capacity is available. Machining and grinding magnesium is more hazardous from the fire standpoint, but otherwise there is no problem. Finishing requires corresponding treatments to aluminum with the possible addition of armor leading edges.

Mold design for casting steel in sand. U. S. Office of Technical Services. Feb 1953. 14p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 111100

1. Molds, Sand - Design 2. Steel - Casting 3. OTS IR 9104.

Post-ballistic examination of 0.5-inch H-plates manually welded with NRC-2A type of ferritic electrode. United States Steel Corporation. Research Laboratory, Kearny, N. J. Progress report on weldability of commercial armor plate (OD-82), by W. G. Benz, R. F. Campbell, F. C. Kristufek, and R. H. Aborn. Feb 1946. 61p photos, (1 fold) fold diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108453

Report no. 558. NDRC research project NRC-1. Contract OEMsr-552.
1. Armor plate - Welding, Electric 2. Armor plate - Ballistic tests 3. NRC-2A (Electrode) 4. Welding - Electrodes - Tests 5. Joints, Welded - Tests 6. WMC M-635 7. OSRD 6583.

Quarterly report no. 1 under Contract no. AF33(616)-78, period May 1 to July 31, 1952, by P. H. Miller, Jr. Pennsylvania. University, Philadelphia, Pa. Jul 1952. 16p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108316

1. Conductors, Semi - Materials 2. Crystals, Zinc oxide - Dielectric properties 3. Crystals, Selenium-tellurium - Photoconductivity.

Search for new resistive materials for high-stability, high-temperature-operating resistors. Battelle Memorial Institute, Columbus, Ohio. Twelfth quarterly interim engineering report, period July 10, 1952 to Oct 10, 1952, under Contract no. AF33(038)-8744, by E. R. Olson, E. H. Layer and A. E. Middleton. Oct 1952. 22p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108309

For 1st-6th, 11th reports see PB 101978-101978s5, 107335.
1. Resistors - Basic materials 2. Materials, Heat resistant 3. Chromium nitrides - Production 4. Chromium titanium nitrides - Production 5. Nitrides, High temperature.

Some effects of high frequency vibrations on metals, a survey of the literature, by E. J. Chapin. U. S. Naval Research Laboratory. Jun 1947. 12p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108356

A limited quantity of information exists in the literature on the effects of high frequency waves on metals. An attempt has been made to classify this information according to the principal effects of the high frequency vibrations on grain size, degasification, heterogeneous systems and allotropic transformations of metals. The possibility for important use of high frequency vibrations in metallurgical processes is indicated in this review of the literature. Problem no. 35M30-05. NRL M3134.

Study of creep of titanium and two of its alloys. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Third progress report, 1 Apr-30 Jun 1951, under Contract no. AF33(038)-14111, by W. R. Kiessel, J. V. Gluck, D. N. Frey, J. W. Freeman. Jun 1951. 34p photos, diagrs, graphs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108489

Two sheet materials, commercially-pure titanium (Ti 75) and a ferrochrome alloy (Ti 150) were received. The techniques and results arrived at are described. The investigation of Ti 75 involved the study of the effects of cold work on interanl structure and on creep resistance. Heat treatments were the main variable investigated for the Ti 150 sheet. Project M896.

Substitutes for beryllium-copper alloys. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Sep 1952. 35p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Limited supply available free from Minerals and Metals Advisory Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. PB 108833

Report prepared and submitted under Contract no. DA-49-025-sc-83. Appendix I: Properties of age-hardening nickel-base alloys. - Appendix II: Discussion of beryllium ore supplies, by Matthew J. Donachie. - Letter from Bengt Kjellgren on the beryl ore situation, May 22, 1952.
1. Beryllium-copper alloys 2. Beryllium - Substitutes 3. Beryllium ores 4. Nickel alloys - Properties 5. MM AB 26-M 6. SIG Contract DA49-025-sc-83.

Surface hardening of titanium by carburizing and induction heat treating. Battelle Memorial Institute, Columbus, Ohio. First interim technical report under Contract no. DA-33-019-ORD-216 covering the period Aug 1, 1951 to Mar 31, 1952, by A. J. Griest, W. M. Parris, P. D. Frost and J. H. Jackson. Mar 1952. 45p photos, diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108892

The objective of this project is to develop methods for carburizing and induction-heat-treating surfaces of commercial titanium-base alloys. These processes are being applied to titanium in an effort to increase its surface hardness, wear resistance, and galling resistance. The objective of the experiments made to date has been to find a treatment which will develop a surface of sufficiently high hardness and good adherence to warrant wear testing. Attention has been given mainly to carburizing treatments. The experiments conducted and the results obtained are discussed in detail. O. O. Project no. TB4-15.

Thermoelectric properties of types 302 and 310 stainless steel, by A. I. Dahl and S. T. Lonberger. U. S. National Bureau of Standards. Oct 1950. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108382

The Alumel element of Chromel-Alumel thermocouples is subject to frequent mechanical failure during service in jet engines. For this type of service, some of the stainless steels are superior to Alumel from the standpoint of resistance to chemical action and mechanical fatigue. The present results show that thermocouples of Chromel and stainless steel are thermoelectrically stable. However, their thermoelectric power is from 1/3 to 1/2 that of Chromel-Alumel. Despite this lower sensitivity, it seems worthwhile to consider the substitution of stainless steel for Alumel, in the interest of extending service life. Purchase order no. (33-038)47-1468-E. AAF TR 6096.

Titanium alloy phase diagrams for the systems titanium-manganese, titanium-tantalum, and titanium-tungsten. Battelle Memorial Institute, Columbus, Ohio. Under contract no. AF33(038)-8544.

Progress report for the period Feb 12-Apr 12, 1950, by D. J. Maykuth, H. R. Ogden, R. I. Jaffee, and B. W. Gonser (Iodide titanium metal base), C. M. Craighead, J. G. Kura and L. W. Eastwood (Process A titanium metal base). Apr 1950. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108425

Progress in current work on the investigation of the phase diagrams of the titanium-manganese, titanium-tantalum, and titanium-tungsten using high-purity iodide titanium as a base material is described. Present activity with these alloys is largely concerned with alloy preparation. Preliminary studies of a screening series of 33 alloys in the Ti-Mn, Ti-Ta, and Ti-W systems have been accomplished. Nine of the low-alloy content ingots have been successfully fabricated into sheet by rolling at 750°C. The balance of the screening alloys were checked for homogeneity before remelting and fabrication. Three process A titanium-base ingots containing 20%, 35% and 50% tungsten have been made and melted twice. For other reports on this contract see PB 108426-108429, 107335.

Progress report for the period Apr 12-Jun 12, 1950, by D. J. Maykuth, H. R. Ogden, R. I. Jaffee, B. W. Gonser, C. M. Craighead, J. G. Kura, and L. W. Eastwood. Jun 1950. 20p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108426

A description of the work done in the investigation of the phase diagrams of the titanium-manganese, titanium-tantalum, and titanium-tungsten systems is given. Alloys with an iodide titanium metal base fabricated to date include compositions through Ti-6Ta, Ti-5W, and Ti-15Mn. Difficulties in melting of the higher tantalum and tungsten alloys led to the adoption of a rigorous schedule of sectioning and melting to detect possible unmelted material. Process-A titanium-base alloys containing up to 30% manganese were prepared and fabricated to sheet by hot and cold working. Radiographic examination indicated that the sheet was homogeneous and suitable for phase diagram work. For other reports on this contract see PB 108425, 108427-108429, 107335.

Titanium-iron phase diagram. University of Notre Dame. Dept. of Metallurgy, Notre Dame, Ind. Contract no. AF33(038)-8495.

Part 1, by W. S. Fretague, C. S. Barker, E. A. Peretti. Nov 1951. 43p photos, drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108423

This project was concerned with the development of a phase diagram of the titanium-iron system, with special emphasis on that region of the diagram be-

tween 0 and 50 percent iron and from room temperature up to an including the solids of the system. An arc melting furnace, employing a water cooled tungsten electrode and copper crucible, was constructed and operated with an argon atmosphere. Approximately seventy-seven arc melted alloys were prepared covering the composition range from 0 to 71 percent iron. Hardness data on the cast alloys were collected and metallographic examination of all as cast alloys performed. A tentative diagram was constructed from the information obtained from metallographic examination of the arc melted alloys, and from published information appearing in the literature. AAF TR 6597.

Part 2, by W. J. Fretague, C. S. Barker, E. A. Peretti. Mar 1952. 53p photos, drawings, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108424

The titanium-iron phase diagram was determined using alloys prepared in nonconsumable electrode, inert atmosphere arc melting furnaces. Both DuPont Process A and iodide titanium were used in the preparation of alloys. Heat treatments were carried out under conditions that minimized contamination of the high purity alloys. Micrographic analysis following isothermal annealing was the chief method used for phase identification of alloys of higher titanium content. Thermal, X-ray and metallographic methods of analysis were employed on alloys of higher iron content. A solubility of iron in alpha titanium of less than 0.2 percent was found at the eutectoid temperature of 595°C.

Upgrading of lead-bearing copper alloy scrap, by John D. Sullivan. National Research Council. War Metallurgy Committee. Feb 1943. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108358

Contract OEMsr-307 supplement 2, Advisory report. 1. Scrap metal, Copper 2. WMC M-55 3. OSRD 1244.

Weldability of commercial armor plate (OD-82 and OD-36-2). United States Steel Corporation. Research Laboratory, Kearny, N. J. NDRC research project NRC-1, Contract OEMsr-552.

Progress report. Jan 1943. 71p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108375

Contents: Part I. Evaluation of welding procedure and technique in terms of ballistic tests, by G. S. Mikhalapov. - Part II. Investigation of the ballistic response of ferritic welds, by R. H. Aborn, O. O. Miller and W. G. Benz. - Appendix I. Ballistic shock testing of ferritic welded armor. - Appendix II. Test procedure for examination of ferritic welded armor. WMC M-45. OSRD 1165.

Final report, by O. O. Miller, W. G. Benz, R. F. Campbell, F. C. Kristufek and R. H. Aborn. Jan 1946. 51p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108371

This report presents the results of an investigation to determine optimum methods of welding commercial armor plate in fabrication of ordnance equipment, with emphasis on the use of ferritic electrodes rather than austenitic. Progress reports are summarized in appendix I, unreported work summarized in appendix II. WMC M-642. OSRD 6567.

Welding of experimental H plates with manganese molybdenum electrodes, by G. S. Mikhalapov, C. H. Jennings, and J. H. Humberstone. National Research Council. War Metallurgy Committee. Advisory report on armor welding electrodes (OD-36-2) and weldability of commercial armor plate (OD-82). Dec 1943. 33p tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108363

Contract OEMsr-307.
1. Armor plate - Welding, Electric 2. Welding - Electrodes 3. WMC M-185 4. OSRD 3057.

METEOROLOGY AND CLIMATOLOGY

Construction and application of contingency tables in weather forecasting, by Eberhard W. Wahl, Robert M. White and Henry A. Salmela. U. S. Air Force. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. Nov 1952. 34p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108596

A statistical procedure based on the use of contingency tables is developed for use in weather forecasting. The method makes use of the knowledge of the climatologically observed and theoretically expected frequency of occurrence of meteorological phenomena. Using such information, it is possible to specify the probability of occurrence of a meteorological phenomenon using the past sequence of meteorological parameters, which are called predictors. This technique has the important advantage that nonlinear relationships between meteorological variables can be taken into account. A forecast scheme is developed by using a succession of contingency tables expressing the relationship between previously specified predictors and the meteorological phenomenon that is to be forecast (predictand). Finally, an actual case history of such a forecast scheme is presented. AAF GRD SG 19.

Microthermal structure of the ocean near Key West, Florida, Part I: Description, by R. J. Urick and C. W. Searfoss. U. S. Naval Research Laboratory. Dec 1948. 30p photos, map, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111134

By means of a specially developed, sensitive, fast-acting thermopile mounted on a submarine, microthermal variations at constant depth in the ocean were investigated. A description of the thermopile, its location on the submarine and a qualitative presentation of the records obtained are given. NRL S-3392.

Some cloud observations with the infrared spectrograph, by Ralph G. Eldridge. Massachusetts Institute of Technology. Dept. of Meteorology. Dec 1952. 18p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108665

Measurements of drop size distributions are presented for sprays from commercial fog nozzles and for mountain fog, as observed by the M.I.T. infrared cloud spectrograph. Scientific report no. 3 under Contract no. AF19(122)-245: Measurement of drop size distribution and liquid water content in natural clouds.

Survey of available information on winds above 30,000 feet, by C. F. Jenkins. U. S. Air Force. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. Dec 1952. 37p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108597

This report is intended to present the existing knowledge of the winds above 30,000 feet. The results of many methods of wind measurement have been reviewed and combined, in order to obtain as complete a picture of the flow patterns as is possible. AAF GRD SG 24.

Tables of thermal radiation and band transmission functions, by Grant R. Fowles. Utah. University. Dept. of Physics, Salt Lake City, Mich. Nov 1952. 14p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108583

Stratospheric radiation technical report no. 7. Contract AF 19 (122)-392.
1. Tables, Meteorological 2. Radiation, Black body 3. Radiation, Thermal - Measurements.

Twilight and airglow study, by Merlin H. MacKenzie and Harold E. Cronin. Geo-Science, Inc. Nov 1952. 27p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108584

Electrophotometric recordings of zenith twilight and nightsky brightness, near Washington, D. C., in the form of continuous traces has been in effect during the phase of this report, which covers the period August 21, 1952 through October 31, 1952. The data collected during this period have been reduced to tabular form and included in this report. Nightsky brightness corrected to full moon has been plotted as a function of moon altitude in degrees for the three classifications of trace recording designated in the report. Zenith twilight intensity has been plotted as a function of shadow height in kilometers for clear and cloudy, moonless twilight intervals. Report no. 7-II: Technical phase, for the period Aug 21-Oct 31, 1952.

Wind stress over water, by William G. Van Dorn. California. University. Scripps Institution of Oceanography. Nov 1952. 32p graphs, map, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108579

The wind-induced slope of the surface of an 800-foot model-yacht pond has been measured to a relative accuracy of 5×10^{-7}. This slope, which is proportional to the sum of the surface and bottom stresses, is shown to be the result of two effects: first, a tangential "friction" drag, which is invariably present and proportional to the square of the windspeed; and second, a "form" drag, which occurs only after the wind has increased above a certain critical value. The slope increased with heavy rain, and a theoretical model is proposed which adequately predicts the observed increase. The present study was modeled closely after Keulegan's experiments in a 60 foot laboratory channel. The results of the two studies agree quantitatively. Technical report no. 1 under Contract no. AF19(122)-413. S10 Reference no. 52-60.

MINERALS AND MINERAL PRODUCTS

Creep and recovery of a mineral glass at normal temperatures, by S. Pearson. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Jun 1950. 20p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108863

Measurements have been made of the creep and recovery of a soda-lime-silica glass over the temperature range from 20° to 80°C. The three parts into which the deformation of the glass can be divided are an instaneous elastic strain; a Newtonian viscous flow at constant rate, which is not recoverable and a delayed elastic strain which develops slowly according to a delay function of time, and which is completely recoverable. The creep and recovery of the glass at normal temperatures can be represented by two described equations. The results of the torsion and tension experiments are plotted. RAE TN MET 57.

Development of sizings for glass fabric in polyester-resin laminates, by Johan Bjorksten, James E. Henning, Luther L. Yaeger, Robert J. Roth. Bjorksten Research Laboratories, Inc., Madison, Wis. Dec 1951. 75p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107770s

A glass-fabric sizing has been developed which consists of vinyl trichlorosilane in conjunction with beta chloroallyl alcohol. Glass-fabric polyester-resin laminates utilizing this sizing on the fabric retained 90% or more of their dry flexural strengths after immersion in boiling water, as compared with a 60% retention for laminates with commercial chrome complex-sized glass fabric. Additional compounds were investigated as sizings for No. 181 glass fabric. Contract no. AF33(038)-8902. AAF TR 6620, Suppl. 1.

ORDNANCE AND ACCESSORIES

Indian synthesis. Delaware. University. Dept. of Chemistry. Quarterly report covering the period Sep 1, 1952-Feb 1, 1953 under Contract no. N174S-9851 to U. S. Naval Powder Factory, Indian Head, Md., by Glenn S. Skinner. Feb 1953. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108802

The purpose of the investigation is the preparation of pure nitramines and multifunctional compounds such as 1,6-diamino-2,3,4,5-hexanetetrol ("1,6-Diaminomannitol") from mannitol. IND S-Q1.

Minutes of a conference on safety measures for acetylene pipe lines. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Report of a fire in the butindiol plant. 1943. 9f photos, drawing, graph (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $2.50. PB 108798

Abstract available as PB 108798s from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
1. Safety devices and measures - Germany 2. Explosions, Acetylene - Prevention - Germany 3. Fire prevention - Germany 4. Micro BIOS FD 3104/46, Frames 1116000960-962 5. Micro BIOS FD 3104/46, Frames 115000955-959.

N.P.F. analysis. Delaware. University. Dept. of Chemistry. Progress report covering the period Sep 1, 1952-Feb 1, 1953 under Contract no. N174S-9852 to U. S. Naval Powder Factory, Indian Head, Md., by James H. McNeal. Feb 1953. 11p drawing, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108801

NPF P-1.
1. Triacetine - Determination 2. Powders, Smokeless - Analysis.

Relative effectiveness of cal. 0.50, cal. 0.60, and 20-mm guns as armament for multiple anti-aircraft machine gun turrets. Columbia University. Statistical Research Group. Aug 1945. 29p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108761

AMP report 140.1 R (revised). SRG report 551.
1. Guns, Anti-aircraft - Ammunition 2. Guns, Anti-aircraft - Performance 3. Guns, Machine - Performance 4. U. S. National Defense Research Committee. Applied Mathematics Panel 5. OSRD 5388.

USAF supply catalog, class 11-B, code 5200: Gunnery equipment, accessories, and maintenance parts. U. S. Air Force. Feb 1952. 144p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18. 75. PB 108735

Basic issue. Replaces edition of 13 Jul 1950 revised 13 Oct 1951.
1. Gunnery equipment - Parts - Catalogs 2. AAF SL 11-B.

USAF supply catalog, class 11-A, code 6400: Bombing equipment accessories, and maintenance parts. U. S. Air Force. Jun 1952. 633p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $80.00. PB 108734

Basic issue. Replaces edition of 24 Feb 1950 revised 23 Dec 1951 and 24 Feb 1952.
1. Bombing equipment - Parts - Catalogs 2. AAF SL-11-A.

Versuche mit durchschlagssicherungen für acetylen (Experiments with explosion arresters for acetylene). I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jun-Aug 1940. 6f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $2.50. PB 108799

English abstract included. Abstract available as PB 108799s. Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
1. Explosions, Acetylene - Prevention - Germany 2. Safety devices and measures - Germany 3. Micro BIOS FD 3128/46, Frames 128001050 4. Micro BIOS FD 3128/46, Frames 126001041-1044.

PACKING AND PACKAGING

Fruit and vegetable storage and pre-packaging. Anglo-American Council on Productivity. Report of a visit to the U. S. A. in 1951 by a specialist team on fruit and vegetable storage and pre-packaging. Feb 1953. 76p photos, map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106469

1. Fruit - Packaging 2. Fruit - Storage 3. Vegetables - Storage 4. Vegetables - Packaging 5. Machines, Packaging 6. Packaging.

Depot manufacture of waterproof case liners. U. S. War Dept. Nov 1944. 11p drawings Available from Library of Congress, Publication Board Project,

Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108771

Supersedes SB 38-2, 18 March 1944.
1. Containers - Linings, Waterproof - Manufacture 2. Liners, Waterproof - Manufacture 3. WD SB 38-2.

Design and testing of sprung suspension containers for large valves, by C. F. Oxbrow. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Nov 1949. 26p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108866

A method of designing the suspension for use in spring-suspension containers or crates employed for the shipment of large electronic tubes or similar devices is described. In the usual form of spring suspension, the tube being shipped is contained in a fabric bag, which is suspended by eight springs and fastened to the crate. A detailed analysis was made of the optimum type and positions of the springs and results were obtained, which will ensure that equipment contained in spring-suspension containers will not be damaged by subjection to excessive deceleration when the container is dropped from a height of as much as 5 ft. RAE TN Rad 469.

Joint final report on development of hydraulic packing materials (Contract W33-038-ac-16676) and on investigation of hydraulic packings and fluids (Contract NOa(s) 8032. Battelle Memorial Institute, Columbus, Ohio. May 1948. 64p graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108648

The various phases of the program which have been worked on include: a survey of industry and literature; a study of spiral failure, the preparation of experimental plasticizers; a rubber and plasticizer evaluation program; studies of the variability of Perbunan 18, the gol structure of rubber, and polimerization; O-ring compounding study; a study of molding technique; specification testing of O-ring; suggestions on the packaging of O-ring; a proposed packing design designation as the A-ring; and packing friction tests. Pages numbered 601-660. 24th joint progress report covering detailed activity for Apr 1-May 1, 1948 and a review of all previous activity on W33-038-ac-13905, W33-038-ac-16676, and NOa(s) 8032.

Simple R. F. heat sealing device for thin plastic containers, an A.E.R.E. report, by W.R.E. Maton. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1952. 15p photos, diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. PB 108566

A small R. F. Oscillator with a low power (c. 60 watts) output is described together with roller type electrodes, for seam welding. Uses of the equipment are discussed and suitable materials described. The oscillator may also be used for low-power induction heating requirements. It is constructed from standard components and is portable and suitable for use in active laboratories. HD. 744. S. O. code no. 70-674-0-96. AERE C/R 1004.

PERSONNEL APTITUDE TESTING

Anxiety and failure as factors in the performance of motor tasks, by Helen G. Price. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1952. 23p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108824

Project no. 509-020-0006. Contract no. AF 33(038)-13214. Thesis - Iowa State University, Aug 1951.
1. Anxiety 2. Neuroses, Anxiety 3. Motor reactions - Measurement 4. Coordination tests 5. Psychiatric tests 6. Iowa State University. Graduate School. Dept. of Psychology, Ames, Ia. 7. AAF HRRC RB 52-34.

Device for use in studying the pattern of hand movements, by Henry P. Birmingham. U. S. Naval Research Laboratory. Jun 1948. 12p photos, diagrs (1 fold) Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111130

A description, and the block and wiring diagrams, of a device which plots against time, on cathode-ray tubes, the position, rate, acceleration, and rate of change of acceleration of the operator's hand in motion. NRL R 3298.

Differential transfer of training between motor tasks of different difficulty, by Earl I. Jones and Edward A. Bilodeau. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1952. 25p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108825

Project no. 509-020-0001.
1. Hands - Coordination 2. Motor reactions - Measurement 3. Coordination tests 4. Psychiatric tests 5. AAF HRRC RB 52-35.

Effects of a stereoscopic sound motion picture on the learning of a perceptual-motor task, by John F. Cogswell. Pennsylvania State College, State College, Pa. Sep 1952. 15p photos, diagr, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111143

Contract N6onr-269, T. O. VII.
1. Motion pictures, Educational 2. Motion pictures,

Stereoscopic 3. Visual perception - Tests 4. SDC TR 269-7-32.

Effects of "G" forces on the performance of teletype operators, by Philip J. Rulon, Philip B. Sampson and Benjamin Schohan. Educational Research Corporation, Cambridge, Mass. Oct 1951. 51p photos, drawing, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108345

Aero Medical Laboratory Contract no. AF33(038)-13233.
1. G force 2. Teletypists, Airborne - Effect of G force 3. Teletypists, Airborne - Effect of turbulence 4. AAF TR 6568.

Effects of knowledge of test results on learning of meaningful material, by Richard S. Hirsch. Pennsylvania State College, State College, Pa. Sep 1952. 30p photos, drawing, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111142

Contract N6onr-269, T. O. VII.
1. Motion pictures, Educational 2. Training - Research 3. SDC TR 269-7-30.

Logistics of sound motion pictures for military training, by C. R. Carpenter. Pennsylvania State College, State College, Pa. Sep 1952. 44p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111113

Contract N6onr-269.
1. Motion pictures, Education 2. Motion pictures, Sound 3. Military training - Visual aids 4. SDC TR 269-7-31.

Relationship of optical effects and film literacy to learning from instructional films, by John Mercer. Pennsylvania State College, State College, Pa. Nov 1952. 21p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111114

Contract N6onr-269.
1. Motion pictures, Educational 2. Motion pictures - Optical effects 3. Military training - Visual aids 4. SDC TR 269-7-34.

Training research: Scope, methodology, and contributions, presented to Joint Panel on Training and Training Devices. U. S. Research and Development Board. Apr 1951. 39p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 111116

HTD 200/2. Contents: Foreword, by Leonard Mead. - Introduction, by John H. Cornehlsen. - Scope and purpose of training research, by Harold Edgerton. - Training research design and methods, by William Kappauf. - Contributions from training research, by William McGehee.

PHOTOGRAPHIC AND OPTICAL GOODS

Handbook, operation, service, and overhaul instructions with parts catalog: Type K-17B aircraft camera (Fairchild) Revised. U. S. Air Force and U. S. Bureau of Aeronautics. Sep 1951. 5p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 37436r

Handbook, operation, service, and overhaul instructions with parts catalog: USAF type C-3 ground camera (Graflex) Revised. U. S. Air Force. Apr 1948. 69p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 37416r2

Lens-film resolving power and aerial image energy distribution of several aerial camera lenses. Eastman Kodak Co., Rochester, N. Y. Mar 1946. 126p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 108759

Contract no. OEMsr-392.
1. Lenses - Resolving power 2. Lenses, Photographic - Tests 3. Photographic - Tests 4. NDRC 16.1-149 5. OSRD 6127.

Operating instructions and parts book: Vacuum printing frame model AF-103, Harold M. Pitman Co., North Bergen, N. J. U. S. Army. n. d. 8p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108976

1. AF-103 (Printing frame) 2. Frames, Printing (Photography) 3. WD TM 5-6054.

Parts catalog for type C-3 ground camera (4x5 Speed Graphic) manufactured by Folmer Graflex Corp. U. S. Air Force. Oct 1941. 116p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 37416r

Parts list section of T. O. 10-10-22.
1. Cameras - Parts 2. Speed Graphic (Camera) 3. C-3 (Camera) 4. AAF TO 10-10-22 revised.

Rutherford process camera for mobile reproduction plant. Instruction book and parts list, manufactured by Rutherford Machinery Company, New York, N. Y. U. S. War Dept. n.d. 56p photos, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108974

Includes Instructions for installing and operating Gleb multi-balanced camera lamps model L-125T, and gast vacuum pump 10F-60V.
1. Cameras - Maintenance and repair 2. Cameras - Parts 3. Lamps, Arc 4. L-125T (Camera lamp) 5. Pumps, Vacuum 6. WD TM 5-6040.

Special monotype-directoplate U. S. Army camera, 24x24 inches. U. S. War Dept. Sep 1944. 41p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25.
PB 108973

Includes Instructions for installing operating Macbeth B1-25 camera lamps, 110 volt, 25 ampere single arc, on monotype-directoplate U. S. Army camera, and General instructions for Beach-Russ vacuum pump no. 1.
1. Cameras - Maintenance and repair 2. Cameras - Accessories 3. Lamps, Arc 4. B1-25 (Camera lamp) 5. Vacuum pumps 6. WD TM5-6000.

U. S. Army vertical projection camera: Instruction manual and parts list, manufactured by Huebner Laboratories, New York, N. Y. U. S. Army. n.d. 32p photo, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108975

1. Photographic printers, Projection - Maintenance and repair 2. Photographic printers, Projection - Parts 3. WD TM 5-6050.

X-ray film processing. U. S. Army. Oct 1951. 186p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.75, Photostat $23.75. PB 108778

Basic issue. Supersedes paragraphs 118-121, 124, 125, and Appendix I, TM 8-280, 30 December 1944 (PB 18593).
1. X-rays - Absorption 2. Films (Photography) - Processing 3. Films (Photography) - Storage 4. Films (Photography), X-ray - Processing 5. WD TM 8-281.

PHYSICS

General

Accuracy of numerical solution of ordinary differential equations, by Theodore E. Sterne. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Oct 1952. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108560

A method is described by which the random and systematic errors may be approximately predicted of numerical solutions of any systems of ordinary differential equations. The errors arise from the accumulation of rounding-off errors, and from the use of erroneous formulas for performing the numerical integrations. The prediction is based on the properties of solutions of the system of equations adjoint to the variational equations of the problem, and is applicable to any method of integration. Project no. TB3-0007 of the Research and Development Division, Ordnance Corps. APG BRLR 834.

Maximal convergence intervals and Gibbs type phenomenon for Newton's approximation procedure, by S. Gorn. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jun 1952. 18p graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 108558

This report finds a largest interval of convergence to an "intermediate" root of an equation when the method used is the Newton Procedure. The point of inflection is revealed as a safe starting point. Also found are the number of oscillating iterations and the number of monotonic iterations needed to achieve a given accuracy. Finally, uniformity of convergence over the interval is discussed. Project no. TB3-0007K of the Research and Development Division, Ordnance Corps. APG BRLR 820.

Numerical analysis problems: Matrix inversion by partitioning. Delaware. University. Dept. of Mathematics. Final report covering the period Sep 15, 1951 to Sep 15, 1952, under Contract no. DA-36-034-ORD-412, by Dr. Russell Remage, Jr. Dec 1952. 50p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25.
PB 108895

Report no. M-1. Continues work reported in APG BRL R823 (PB 108266).

On the covergence of a solution of a difference equation to a solution of the equation of diffusion, with an appendix on a uniform approximation to Fourier coefficient, by M. L. Juncosa and David Young. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1952. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108556

Previous results by other authors on the convergence of solutions of difference equations to the Fourier series solution of the equation of diffusion have been extended. Using a generalization of Fejér's theorem on summability (C, 1) of Fourier Series, convergence has been proved under weaker restrictions on the initial conditions, nature of approximate solutions, and admissable ranges of the ratio $\Delta t(\Delta x)^2$. The appendix contains a similar application of Fejer's theorem. Project no. TB3-0007K of the Research and Development Division, Ordnance Corps. APG BRLR 817.

Recent advances in the theory of supersonic flow, by Robert Sauer. U. S. Naval Ordnance Laboratory, White Oak, Md. Mar 1951. 64p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108804

This report contains a series of lectures on supersonic and hypersonic flow. The subject matter covers a number of advanced topics in the field of aeroballistics, based on research carried out by the author. The results are applicable to the solution of aerodynamic problems in the design of supersonic and hypersonic missiles. An exposition is given of methods to calculate flow about slowly oscillating bodies as well as past yawing bodies of revolution. Aeroballistic research report no. 13. NAVORD 1593.

Sequential tests of statistical significance, a memorandum submitted to the Applied Mathematics Panel, National Defense Research Committee. Columbia University. Statistical Research Group. Mar 1944. 13p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108750

SRG memorandum 180. AMP memorandum 30.1M. 1. Sequential analysis 2. Statistical theory 3. OSRD 3581.

Stress and velocity fields in soil mechanics, by R. T. Shield. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Dec 1952. 36p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108592

Lines of discontinuity in the plastic stress field of a cohesive soil in a state of plane strain are discussed. The jump conditions on the stresses and the restrictions on the velocity field in the neighborhood of the line are obtained. The theory is applied to the problem of uniform pressure on one face of a wedge (or earth dam), and to the problem of a loaded trapezoid. Finally, an analytic integration of the plane strain equations is carried out. Expressions are derived for the coordinates and curvatures of the failure lines and the velocity components at any point of a plastic stress field in terms of the boundary values. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-81/36. GDAM TR81.

Techniques of applied mathematics: Theory of distributions, by Bernard Friedman. New York University. Washington Square College of Arts and Sciences. Mathematics Research Group. Oct 1952. 48p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108690

Contract no. AF-19 (122)-42. Research report no. EM-47. Second chapter of a proposed book on Techniques of applied mathematics.

1. Mathematics, Applied 2. Fourier analysis 3. Equations, Integral 4. Random distribution - Theory.

Nuclear

Accuracy limitations in determinations of particle energies and vector momenta in nuclear emulsions, an A.E.R.E. report, by J. J. Wilkins. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Sep 1952. 24p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108568

A study is made of sources of error in measurements on alpha-particles ($\leq$ 40 MeV) and protons ($\leq$10 MeV) in Ilford C2 and E1 nuclear emissions. Observations on range-straggling reported in the literature are reviewed and their significance is clarified. Typical errors introduced by techniques of track measurement and by the limited resolving power of the emulsions are assessed by a detailed analysis of some measurements on $^{12}C(\gamma, 3\alpha)$ photodisintegration stars in E1 emulsions. The accuracy achieved in these measurements is studied as a function of the dip-angle of the star tracks, enabling the effects of different errors to be separated to a considerable extent. Finally the conclusions of the paper are presented in convenient graphical forms, showing the accuracy to be expected in determinations of energy and vector momentum values. HD. 771. S. O. code no. 70-674-1-05. AERE G/R 1020.

Fast coincidence circuit for experiments with high energy particles, an A.E.R.E. report, by J. M. Dickson, D. C. Salter, O. Gunnill, P. Dolley, J. M. Cassels. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1952. 8p drawings, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108677

A simple fast double coincidence circuit is described. It has been tested both with artificial pulses and with pulses produced by 147 MeV protons from the Harwell cyclotron. Resolving times of the order of 5×10^{-9} secs. were comfortably achieved. It is suggested that the circuit could be adapted to record triple coincidences. HD. 794. S. O. code no. 70-674-1-10. AERE G/R 1039.

Fission products for insect control by Charles C. Hassett and Dale W. Jenkins. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Dec 1952. 19p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108883

Project no.: 4-65-20-001. Test Program n.: T5. 1. Waste, Radioactive - Uses 2. Fission products - Uses 3. Gamma rays - Industrial application 4. Gamma rays - Uses 5. Insect repellents, Radioactive 6. Insect control 7. CC MD RR 149.

New experimental factor limiting the quantitative application of emanating power measurements to the study of diffusion problems, an A.E.R.E. report, by D.J.M. Bevan. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1952. 19p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 108723

Any attempt to apply emanating power results quantitatively to diffusion problems requires that the source distribution of the particular emanating isotope used should be uniform and constant. In the majority of experimental work, thoron is used as the diffusing species and radio thorium the parent atomic type. This decays to thoron through the intermediate daughter product, thorium X. With oxides of the fluorite type and certain other compounds also, high temperature treatment leads to a concentration of thorium X in or near a surface, and consequent deviation from uniformity of the source distribution. This effect is discussed qualitatively in terms of the Schottky-Wagner theory of defective solids. HD. 785. S. O. code no. 70-674-1-07. AERE C/R 988.

Preparation and use of pile-made gamma sources for industrial radiography, by W. S. Eastwood. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1950. 8p photos, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108846

HD. 457. S. O. code no. 70-674-0-16.
1. Gamma rays - Sources - Gt. Brit. 2. Radiography, Industrial - Apparatus - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE I/R 638.

Production of ^{131}I from pile-irradiated tellurium, an A.E.R.E. report, by B. J. Miles, C. W. Fletcher, R. A. Faires, B. R. Payne and F. Hudswell. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1952. 13p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108729

The present method of production is described in full detail. Various remote control improvements have been installed and the apparatus has been made compact. The rate of production has been increased, and it is now possible to process 20 cans of tellurium per week; at the present pile power, this means that 10 to 11 curies of iodine (calculated back to pile shut-down) is the weekly attainable rate with two operators. The methods of checking the purity and strength of the product are also described. HD 797. S. O. code no. 70-674-1-14. AERE I/R 1038.

Some comments on the calibrations of the Harwell neutron source and the G.L.E.E.P. neutron density, an A.E.R.E. report, by D. J. Littler and E. E. Lockett. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1952. 5p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 108569

This report summarises the comparisons which have been made between the Harwell neutron source and other calibrated neutron sources, and between the G.L.E.E.P. standard neutron density and other neutron density standards. It is shown that all the comparisons agree within the statistical accuracy of the experiments despite the fact that a number of different methods for absolute counting have been employed in establishing the various standards. By combining the comparison measurements with the earlier calibrations, new values are obtained for these two quantities, and the standard errors quoted originally have been considerably reduced. HD 781. S. O. code no. 70-674-1-06. AERE R/R 1035.

RUBBER AND RUBBER PRODUCTS

Improved apparatus for the Gehman flexibility test at low temperatures, by T. H. Murray and N. R. Legge. Polymer Corporation, Ltd. Physical Research Laboratory. Research and Development Division, Sarnia, Ontario, Canada. Oct 1950. 21p photo, drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108212

A modification of the Gehman apparatus for the determination of the flexibility of rubber at low temperatures is described. Typical flexibility curves are shown for butadiene-styrene and butadiene-acrylonitrile copolymers. SSR-158.

Notes on the Reppe butadiene synthesis (Description of the work, formulas, reports of conferences, memoranda, and general notes). I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1939-1943. 500f drawings, diagrs, graphs, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $65.00. PB 108738

Some frames will not reproduce well. Some notices are duplicated. Abstract available as PB 108738s from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
1. Butadiene - Production - Plants - Germany 2. Butadiene - Recovery from 1.4 butanediol - Germany 3. 1,4-Butanediol - Dehydrogenation - Germany 4. Acetylene chemistry - Research - Germany 5. Butynediol - Hydrogenation-plants - Germany 6. I. G. Farbenindustrie A. G. - Plants-layouts - Germany 7. Amphoseife 18 (Trade name) 8. Furan, Tetrahydro - Production - Germany 9. Hexamethylenediamine - Germany 10. Phthalocyanines - Patents 11. Isoprene - Polymerization - Germany 12. Micro TOM 119 13. Micro BIOS FD 3486/48, Frames 1-155.

Vulkollanes. Report no. 1: Survey on the problems and state of development of vulkollanes, by Dr. Konrad. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jan 1946. 4p Available from Library of Congress, Publication Board Project, Washington

25, D. C. Microfilm $1.25, Photostat $1.25. PB 108870

1. Vulkolan (Trade name) 2. Coatings, Rubber - Synthetic - Germany 3. Isocyanates, Di - Reactions - Germany.

STRUCTURAL ENGINEERING

Behavior in pure bending of a long monocoque beam of circular-arc cross section, by Robert W. Fralich, J. Mayers and Eric Reissner. U. S. National Advisory Committee for Aeronautics. Jan 1953. 33p drawings, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108669

1. Loads, Structural - Bending 2. Beams - Bending moment 3. Beams - Buckling 4. Plates, Curved - Stresses 5. Shells (Aircraft) - Bending 6. Loads, Structural - Bending 7. NACA TN 2875.

Cement for engineering and large scale building. Gt. Brit. Ministry of Works. Oct 1952. 4p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108685

1. Cements - Analysis - Gt. Brit. 2. Cements - Mixtures - Gt. Brit. 3. Aggregates, Cement-bonded - Gt. Brit. 4. Building materials - Conservation - Gt. Brit. 5. MOW EM 2, New Series.

Cement for housing and small scale building. Gt. Brit. Ministry of Works. Oct 1952. 4p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108684

1. Cements - Analysis - Gt. Brit. 2. Cements - Mixtures - Gt. Brit. 3. Aggregates, Cement-bonded - Gt. Brit. 4. Building materials - Conservation - Gt. Brit. 5. Houses - Construction - Use of cement - Gt. Brit. 6. Mortar (Building material) - Gt. Brit. 7. MOW EM 1, New Series.

Dynamic transverse loading of beams of a material exhibiting linear strain-hardening, by Margaret F. Conroy. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Nov 1952. 24p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108593

Contract N7onr-35801, T. O. I, NR-041-032.
1. Equations of motion 2. Beams - Plastic deformation 3. Beams - Load 4. Boussinesq solution 5. GDAM A11-82/24 6. GDAM TR 82.

Effect of initial curvature on the strength of an inelastic column, by Thomas W. Wilder, III, William A. Brooks, Jr., and Eldon E. Mathauser. U. S. National Advisory Committee for Aeronautics. Jan 1953. 17p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108603

1. Beams - Plastic deformation 2. Beams - Stresses 3. Loads, Structural - Theory 4. Loads - Aeroelasticity 5. Materials, Aircraft - Plasticity 6. Airplanes - Structure 7. Structures - Buckling 8. NACA TN 2872.

Effect of longitudinal stiffeners located on one side of a plate on the compressive buckling stress of the plate stiffener combination, by Paul Seide, U.S. National Advisory Committee for Aeronautics. Jan 1953. 66p drawings, graphs, diagrs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108668

1. Plates, Flat - Compression tests 2. Plates, Flat - Stresses 3. Plates, Flat - Buckling 4. Loads, Structural - Theory 5. NACA TN 2873.

Engineer supply catalog: Supplementary equipment, set no. 13, soil testing (concrete). U. S. Army Service Forces. May 1945. 6p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108772

Supersedes ENG 6 870-13, 21 Oct 1943.
1. Concrete - Mix proportions - Testing apparatus 2. Soils - Testing equipment 3. Road materials - Testing equipment 4. Roads - Surface treatment - Concrete - Testing equipment 5. Roads - Surface treatment - Soil compaction - Testing equipment 6. Roads, Concrete - Testing equipment 7. ASF Cat ENG 6 870-13.

Heating and ventilation in factories, fifth edition. Gt. Brit. Ministry of Labour and National Service. Factory Dept. 1952. 121p photos, drawings, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 108929

S. O. code no. 36-210. Welfare pamphlet no. 5.
1. Heating, Industrial - Gt. Brit. 2. Ventilation - Factories - Gt. Brit.

Industrial application of aerodynamic techniques. Gt. Brit. National Physical Laboratory. Aerodynamics Division. 1952. 44p photos, diagrs, maps Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108705

Notes on applied science no. 2. S. O. code no. 48-120-2*.
1. Buildings - Wind pressures - Gt. Brit. 2. Bridges, Suspension - Design - Gt. Brit. 3. Bridges, Suspension - Stability - Gt. Brit. 4. Wind tunnel tests - Gt. Brit. 5. Winds - Velocity - Gt. Brit. 6. Air flow - Theory - Gt. Brit. 7. Aerodynamics - Theory - Gt. Brit. 8. Industrial research - Aerodynamics - Gt. Brit. 9. DSIR NPL NAS 2.

On traveling waves in beams, by Robert W. Leonard and Bernard Budiansky. U. S. National Advisory Committee for Aeronautics. Jan 1953. 78p diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108604

1. Structures - Impact loading 2. Beams - Plastic deformation 3. Beams - Vibration 4. Loads, Structural - Theory 5. Loads, Dynamic - Theory 6. Timoshenko's equation 7. NACA TN 2874.

Using bricks to best advantage. Gt. Brit. Ministry of Works. Oct 1952. 4p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.05. PB 108686

1. Building materials - Conservation - Gt. Brit. 2. Bricks - Coatings - Gt. Brit. 3. Bricks - Uses - Gt. Brit. 4. Houses, Brick - Construction - Gt. Brit. 5. MOW EM 3, New Series.

TEXTILES AND TEXTILE PRODUCTS

British cotton industry. Anglo-American Council on Productivity. Report of a productivity team from the United States of America which visited the United Kingdom in 1951. Dec 1952. 45p photos, diagr, map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106464

1. Cotton industry - Gt. Brit.

German rayon industry during the period 1939-1945, prepared by A. R. Urquhart. British Intelligence Objectives Subcommittee. 1952. 393p photos, drawings (part fold), diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $5.75. PB 108698

S. O. code no. 51-283-33.
1. Rayon industry - Germany 2. Rayon, Cellulose acetate - Manufacture - Germany 3. Rayon, Cuprammonium - Manufacture - Germany 4. Rayon, Viscose - Manufacture - Germany 5. BIOS OR 33.

Report of meeting of Sub-Committee 1 on Colour Fastness Tests of Technical Committee 38 on Standardization of Textiles of the International Organization for Standardization New York, U. S. A., Nov 10-12, 1952, by C. H. Bayley and E. V. Burnthall. International Organization for Standardization. Technical Committee on Standardization of Textiles. Nov 1952. 55p graph, tables Available from National Research Council of Canada, Ottawa, Canada. $.75. PB 108618

Contents: - Appendix I: Use of the grey scale for assessing the effect on the pattern in fastness testing, by K. McLaren. - Appendix II: Some observations on the spacing of the gray scale to be used for assessing staining. (Submitted to I.S.O. by Society of Dyers & Colourists, August, 1952). - Appendix III: International grey scale for assessing the effect on the pattern in fastness testing. (Submitted to I.S.O. by Society of Dyers & Colourists, August 1952). - Appendix IV: Methods for testing color fastness to light of textiles, replacing proposed draft of December 12, 1951 for international consideration. - Appendix V: General principles relating to the wording of test methods. NRCC 2883.

Report of meeting of Technical Committee on Standardization of Textiles of the International Organization for Standardization, Bournemouth, England, June 4-9, 1951, by C. H. Bayley and C. Eugene Coke. International Organization for Standardization. Technical Committee on Standardization of Textiles. Sep 1951. 28p table Available from National Research Council of Canada, Ottawa, Canada. $.50. PB 108471

This report covers the meeting of Technical Committee no. 38 of the International Organization for Standardization.
1. Dyes and dyeing - Fastness 2. Yarn - Physical properties 3. Cordage - Physical properties 4. Rope - Physical properties 5. Fabrics - Shrinkage 6. Fabrics - Tests 7. Textiles - Standards 8. NRCC 2521.

Survey to improve the utilization of wool in Navy fabrics, by Walter J. Hamburger, Simon Williams, and Leonard N. Backer. Fabric Research Laboratories, Inc., Boston, Mass. Dec 1952. 175p photos, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $4.50. PB 111096

Contract NOnr 478(00). Case no. C51137. Bibliography at end of each section.
1. Fibers, Synthetic - Blending with wool 2. Textile fibers - Blending 3. Fabrics, Wool and worsted - Research 4. Wool - Blending with synthetic fibers 5. Textile machines - Design 6. Textile fibers - Blending - Bibliography.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Approximate calculation of the influence of wall boundary layers upon the blockage interference in a high speed wind tunnel, by Sune B. Berndt. Flygtekniska Försöksanstalten (FFA) Stockholm. 1952. 13p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108694

The wall boundary layers in a subsonic wind tunnel work to reduce the choking effect of a model. A simple approach to a theoretical explanation is used. It involves neglecting viscosity, linearization of the

equations of motion and substitution of wall layers of constant velocity for the boundary layers. Solutions are given for plane and axisymmetric flow. Results of numerical application to the case of a parabolic are profile in plane flow confirm experimental results and indicate strong boundary layer effects to occur at Mach numbers close to one. FFA 45.

Calculation of pressure on slender airplanes in subsonic and supersonic flow, by Max A. Heaslet and Harvard Lomax. U. S. National Advisory Committee for Aeronautics. Mar 1953. 25p diagrs, graph Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108786

1. Wing theory 2. Wings - Sweep - Theory 3. Airplanes - Pressure distribution 4. Flow, Subsonic - Theory 5. Flow, Supersonic - Theory 6. Tail surfaces - Velocity - Measurements 7. NACA TN 2900.

Deformation analysis of tapered swept wings, by A. H. Hall. Canada. National Aeronautical Establishment. Dec 1952. 29p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Also available for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 108881

Laboratory Report: LR-44. See also NAEC LR-28 (PB 107103).
1. Wings, Swept - Deformation - Canada 2. Wings, Swept - Root sections - Deformation - Canada 3. Wings - Model tests - Canada 4. Wings, Tapered - Sweep - Canada.

Design of jettisonable cockpit hoods, by I. L. Keiller. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1951. 34p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.60. PB 108841

Cover date is 1952. Technical note no. M.E. 82. S. O. code no. 23-9007-5.
1. Hoods, Cockpit - Design - Gt. Brit. 2. Airplanes - Equipment - Jettisonable - Gt. Brit. 3. ARC CP 105 4. RAE TN ME82.

Diffuser investigations in a supersonic wind tunnel, by J. L. Diggins. U. S. Naval Ordnance Laboratory, White Oak, Md. Jan 1951. 28p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108803

Some results are presented from the first tests in a program to determine the most efficient diffuser configuration for use in a supersonic wind tunnel. Sufficient data have been obtained at M 2.48 and M 2.83 to make possible the design of a simple yet very efficient diffuser to be used at these Mach numbers in a supersonic wind tunnel with a square cross-section. Aeroballistic research report no. 17. NAVORD 1570.

Effect of endplates on swept wings, by D. Küchemann and D. J. Kettle. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1951. 23p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 108840

Cover date is 1952. Report no. Aero. 2429. S. O. code no. 23-9007-4.
1. End plates - Effects - Gt. Brit. 2. Airplanes - Fins - Effects - Gt. Brit. 3. Tail surfaces - Interactions with fins - Gt. Brit. 4. ARC CP 104.

Graphical solution of Multhopp's equations for the lift distribution of wings, by F. Vandrey. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1951. 8p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 108836

Cover date is 1952. A.R.L./R1/G/AE/2/5. S. O. code no. 23-9006-96.
1. Wings - Lift - Gt. Brit. 2. Multhopp method - Gt. Brit. 3. Mathematics, Applied - Aerodynamics - Gt. Brit. 4. ARC CP 96.

Investigation of means to maintain zero electrical charge on aircraft. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Interim report for period May 1-Aug 1, 1952 under Contract no. AF-19 (122)475, by R. W. Hendrick. Aug 1952. 16p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108572

This report covers a period during which several major components were received, tested and modified to fit into the established system design. When all components were considered ready for over-all system tests, an aircraft and generating voltmeter analogue which had been previously designed and constructed, was used to test the electronic portions of the zero charge system. At the same time proper generating voltmeter locations were established by IBM machine calculations and by electrolytic conductivity tank measurements using a model of the aircraft wing. CAL RA-766-P-5.

Low-speed experimental study of the directional characteristics of a sharp-nosed fuselage through a large angle-of-attack range at zero angle of sideslip, by William Letko. U. S. National Advisory Committee for Aeronautics. Mar 1953. 27p photo, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108793

1. Fuselages - Static tests 2. Stability, Directional - Static tests 3. Airplanes - Protuberances - Drag 4. Bodies of revolution - Drag, Frictional 5. Airplanes - Sideslip 6. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 7. NACA TN 2911.

Note on profile drag calculations for low-drag wings with cusped trailing edges, by R. C. Lock. Gt.

Brit. Ministry of Supply. Aeronautical Research Council. Apr 1946. 10p graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 108297

Cover date is 1952. S. O. code no. 23-2419.
1. Wings flaps, Trailing edge - Gt. Brit. 2. Wing profiles - Drag - Calculations - Gt. Brit. 3. Wing profiles - Wind tunnel tests - Gt. Brit. 4. Wings - Drag - Gt. Brit. 5. Mathematics, Applied - Aerodynamics - Gt. Brit. 6. Ailerons - Trailing edges - Gt. Brit. 7. ARC RM 2419.

Some effects of Reynolds number on a cambered wing at high subsonic Mach numbers, by H. E. Gamble. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1951. 34p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108839

Cover date is 1952. Report no. Aero 2423. S. O. code no. 23-900-7-3.
1. Reynolds number - Effect - Gt. Brit. 2. Mach number - Effect - Gt. Brit. 3. Wings, Sweptback - Aspect ratio - Gt. Brit. 4. Wings, Sweptback - Pressure distribution - Gt. Brit. 5. Wings - Model tests - Gt. Brit. 6. Camber, Aerodynamic - Gt. Brit. 7. Flow, Subsonic - Theory - Gt. Brit. 8. Mathematics, Applied - Aerodynamics - Gt. Brit. 9. ARC CP 103.

Sul calcolo in termini finiti dell' effusore di una galleria bidimensionale supersonica. (Calculation of the shape of a two-dimensional supersonic nozzle in closed form), by Dante Cunsolo. Jan 1953. 29p diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108642

Translated from L'Aerotecnica, Vol. XXXI, no. 4, 15 August 1951, p. 225-230.
1. Nozzles, Two dimensional - Supersonic - Italy 2. Mach number - Effect - Italy 3. Hodographs - Italy 4. Prandtl-Mayer theory (Aerodynamics) - Italy 5. U. S. National Advisory Committee for Aeronautics 6. NACA TM 1358.

Theoretical calculation of the pressure distribution, span loading, and rolling moment due to sideslip at supersonic speeds for thin sweptback tapered wings with supersonic trailing edges and wing tips parallel to the axis of wing symmetry, by Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. U. S. National Advisory Committee for Aeronautics. Feb 1953. 70p drawings, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108784

1. Flow, Supersonic - Theory 2. Wing theory 3. Ailerons - Trailing edges 4. Wings, Sweptback - Pressure distribution - Calculations 5. Wings, Sweptback - Span load distribution - Calculations 6. Wings, Sweptback - Rolling moments - Calculations 7. Wings, Sweptback - Taper and twist - Calculations 8. Wings, Sweptback - Loading - Calculations 9. Wings, Sweptback - Aspect ratio - Calculations 10. Wings, Tapered - Aerodynamics 11. Mach number - Effect 12. Stability, Directional - Static tests 13. NACA TN 2898.

Theoretical investigation of the longitudinal response characteristics of a swept-wing fighter airplane having a pitch-attitude control system, by Fred H. Stokes and J. T. Matthews. U. S. National Advisory Committee for Aeronautics. Jan 1953. 41p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108606

1. Controls, Longitudinal - Operation 2. Controls, Automatic - Operation 3. Stability, Automatic 4. Mach number - Effect 5. Pitching moment coefficients 6. Pilots, Automatic - Controls 7. Airplanes, Fighter - Maneuverability tests 8. Wings, Swept - Stability 9. NACA TN 2882.

Instruments

Airborne indicator for measuring vertical velocity of airplanes at wheel contact, by Robert C. Dreher U. S. National Advisory Committee for Aeronautics. Feb 1953. 19p photos, drawings, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108880

1. Indicators, Air position - Vertical velocity 2. Loads, Landing - Impact 3. Impact - Measurements 4. Velocity, Vertical - Measurements 5. NACA TN 2906.

Fuel flow rate and fuel quantity system (capacitor type), by A. C. Smith and J. F. Storm. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. Dec 1950. 138p photos, drawing, diagrs (part fold), graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 108877

Contract AF33(038)-9741. Appendix I: Characterized tank unit design study. - Appendix II: Instructions for calibration of totalizing fuel quantity indicating system. - Appendix III: Nonlinear potentiometer calculation and linearizing data for B-47B, F-93A demonstration tank. - Appendix IV: Photographs. - Appendix V: Method of determining capacitance function for characterized tank units. AAF TR 5850.

USAF supply catalog, class 05-E, code 6300: Aircraft and training aids instrument standard maintenance parts. U. S. Air Force. Sep 1950. 459p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $57.50. PB 108733

Basic issue. Replaces active stock list S-05-E dated 25 May 1947 revised 25 Sep 1948, dead items

stock list S-05E DEAD dated 25 Mar 1947 revised 25 Sep 1947, and Interim addendum S-05 E-B dated 25 Feb 1947.
1. Instruments, Aeronautical - Parts - Catalogs 2. Pilots, Air - Training equipment - Parts - Catalogs 3. AAF SL 05-E.

Engines and Propellers

Some tests of a refrigerated rotating cylinder for measuring ice accretion, by Quan and H. G. Wenham. Canada. National Aeronautical Establishment. May 1952. 10p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Also available for exchange from National Aeronautical Establishment, Montereal Road, Ottawa, Canada. PB 108882

Laboratory Report: LR-45.
1. Cylinders, Rotating - Ice accretion - Canada 2. Cylinders, Rotating - Refrigerated - Canada 3. Ice formation - Temperature - Canada 4. Ludlam limit (Ice accretion) - Canada 5. Low temperature research - Canada 6. Smith detector (Ice accretion) - Canada 7. NAEC LR-45.

Study of secondary-flow patterns in an annular cascade of turbine nozzle blades with vortex design, by Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. U. S. National Advisory Committee for Aeronautics. Mar 1953. 29p photos, drawings, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108791

1. Flow, Subsonic - Theory 2. Flow, Supersonic - Theory 3. Flow, Turbulent - Theory 4. Cascades (Aerodynamics) - Theory 5. Boundary layer - Aerodynamics 6. Turbines, Axial - Flow 7. Turbines - Blades, Internally cooled 8. Nozzles - Air flow 9. NACA TN 2909.

Airports and Airways

Topsoil and seeding studies at Vicksburg, Mississippi, by E. C. Meredith. U. S. Waterways Experiment Station, Vicksburg, Miss. Feb 1953. 63p photos, graphs, tables Available from Director, Waterways Experiment Station, Vicksburg, Miss. $1.00. PB 108828

Technical Memorandum no. 3-354.
1. Soil conditioning - Research 2. Airports - Drainage 3. Airports - Sites 4. Airports - Pavements - Tests 5. Soils - Tests 6. Clay - Tests 7. Soils, Subgrade 8. Grasses - Seeding 9. WES TM 3-354.

Aerodynamics

Ar 232 mit grenzschichtbeeinglussung (Wing with boundary layer control for ar 232 aileron-wing-rib-3), by Drösti. Arado Flugzeugwerke G.m.b.H., Brandenburg, Ger. Nov 1942. 10p graphs (Text in German and English) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108630

Calculations are presented of boundary-layer effect on aileron and wing-rib 3 upon the Ar 232 transport Data are given on gliding angle and rate of descent with and without boundary layer control, wing thickness distribution, and air quantity distribution on wing in the case of application of suction. AAF TR 3179.

Average skin-friction drag coefficients from tank tests of a parabolic body of revolution (NACA RM-10), by Elmo J. Mottard and J. Dan Loposer. U.S. National Advisory Committee for Aeronautics. Jan 1953. 18p photos, diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108482

1. Bodies of revolution - Drag, Frictional 2. Bodies, Submerged - Hydrodynamics 3. Model basin tests 4. Reynolds number - Effect 5. Flow, Incompressible 6. Flow, Turbulent 7. NACA TN 2854.

Two-dimensional unsymmetric flow patterns at Mach number one, by Gottfried Guderley and Hideo Yoshihara. U. S. Air Force. Wright Air Development Center. Aircraft Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jan 1952. 56p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108485

Two-dimensional unsymmetric flow patterns at Mach number one are discussed by means of the hodograph representation. As an example, the flow over a wedge profile is investigated and the pressure distribution and the lift curve slope are computed. The results indicate that the value of the lift curve slope at Mach number one is much lower than what would be expected by an extrapolation from the purely supersonic results. Appendix: Estimation of the influence of the supersonic region at the nose of the wedge profile. AAF TR 6683.

Land Transportation

Bromsutrustning för traktorvagnar (Braking equipment for tractor trailers), by Sigfrid Bjerninger and Allan Pettersson. Jordbrukstokniska Institutet, Ultuna, Uppsala, Sweden. 1952. 14p photos, diagrs (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108691

1. Trailers - Braking equipment - Sweden 2. Tractors - Braking equipment - Sweden 3. Jordbrukstekniska Institutet, Ultuna, Uppsala, Sweden. Cirkulär 8.

Drivkärror. Undersökning av direktdrivna traktorkärros användbarhet för lantbrukstransporter (Investigation on the usefulness of p.t.o.-driven trailers for farm transports), by Gustaf Aniansson. Jordbruckstekniska Institutet, Ultuna, Uppsala, Sweden. 1952. 96p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 108347

1. Trailers - Use in agriculture - Sweden 2. Jordbruckstekniska Institutet, Ultuna, Uppsala, Sweden. Meddelande no. 243.

Organizational spare parts and equipment for truck, 2½-ton, 6x6, machine shop, M16 and M16A1 (load B, B1, and B2). U. S. Army Service Forces. Apr 1945. 30p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108767

Supersedes ORD 7 SNL G-146, Volume 2, Organizational spare parts and equipment, dated October 1944. Technical reference TM 9-801. For volumes 3-5, see PB 108768-PB 108770.
1. M16 (Truck) 2. M16A1 (Truck) 3. Trucks, Machine shop - Parts 4. Machine shops, Mobile - Parts 5. ASF Cat ORD 7 SNL G-146, Vol. 2.

Organizational spare parts and equipment for truck, 2½-ton, 6x6, machine ship, M16 and M16A1 (load C). U. S. Army Service Forces. Nov 1944. 36p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108768

Supersedes SNL G-146, Volume 3, Organizational spare parts and equipment, dated 14 June 1943, and changes no. 2, dated 24 December 1943. Technical reference TM 9-801.
1. M16 (Truck) 2. M16A1 (Truck) 3. Machine shops, Mobile - Parts 4. Trucks, Machine shop - Parts 5. ASF Cat ORD, 7SNL G-146, Vol. 3 6. SNL G-146, Vol. 3.

Organizational spare parts and equipment for truck, 2½-ton, 6x6, machine shop, M16 and M16A1 (load D). U. S. Army Service Forces. Nov 1944. 34p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108769

Supersedes SNL G-146, Volume 4, Organizational spare parts and equipment, dated 1 July 1943, and changes no. 2, dated 24 December 1943. Technical reference TM 9-801.
1. M16 (Truck) 2. M16A1 (Truck) 3. Trucks, Machine shop - Parts 4. Machine shops, Mobile - Parts 5. ASF Cat ORD 7 SNL G-146, Vol. 4 6. SNL G-146, Vol. 4.

Organizational spare parts and equipment for truck, 2½-ton, 6x6, machine shop, M16 and M16A1 (load F). U. S. Army Service Forces. Dec 1944. 32p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108770

Supersedes SNL G-146, Volume 5, Organizational spare parts and equipment, dated 24 September 1943, and changes no. 1, dated 9 January 1944. Technical reference TM 9-801.
1. M16 (Truck) 2. M16A1 (Truck) 3. Trucks, Machine shop - Parts 4. Machine shops, Mobile - Parts 5. ASF Cat ORD 7 SNL G-146, Vol. 5. 6. SNL G-146, Vol. 5.

Marine Transportation

La cavitazione nelle eliche navali (Cavitation in ships propellers), by Emilio Castagneto. May 1952. 52p drawings, graphs, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108821

Translation of a lecture given in Genoa, 30 December, 1950, at Society Naval Architecture, and in Rome, January 17, 1951, at Ministry of Naval Defence. Published by: National Institute for Research & Testing in Naval Architecture, Vol. III, Year 1950, Part II. Translated by F. Rizzo.
1. Propeller blades - Cavitation - Tests - Italy
2. Propellers, Marine - Cavitation - Italy
3. NAVSHIPS T 476.

Om djupgaendets inflytande pa propulsionsegenskaperna (Influence of draught on propulsive qualities), by Hans Edstrand. Sweden. Statens Skeppsprovningsanstalt, Göteborg, Sweden. 1952. 25p graphs, tables (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108348

Summary in English.
1. Ships - Propulsion - Effect of draught - Sweden
2. Ships - Resistance - Tests - Sweden 3. Model basin tests - Sweden 4. Sweden. Statens Skeppsprovningsanstalt, Götenberg, Sweden. Meddelanden no. 21.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

Critical supercooling of pure water droplets by a new microscopic technique, by G. M. Pound, L. A. Madonna and S. L. Peake. Carnegie Institute of Technology. Metals Research Laboratory. Dec 1952. 17p photos, diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108389

Very pure water droplets of 10 to 50 microns in diameter were condensed in silicone oil to form an emulsion. A portion of this emulsion was placed on the specially designed cold stage of a Bausch and Lomb Research Metallograph and cooled to a low temperature. Temperature of the emulsion was

measured by a small thermocouple, and freezing of the droplets was detected by observation with polarized light. The supercooling that is critical for ice formation was observed to be -40 $\pm$ 2°C, in agreement with the results of Schaefer and of Owilong. Scientific report no. 1 under Contract no. 19 (122)-185.

Theory of water, by E. Forslind. Svenska Forskningsinstitutet för Cement och Betong, Stockholm. Sep 1952. 43p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108023

1. Water - Molecular structure - Sweden 2. Svenska Forskningsinstitutet för Cement och Betong. Handlingar nr. 16.

MISCELLANEOUS

Establishment and maintenance of turf on stabilized granular material. U. S. Army. Corps of Engineers. Ohio River Division Laboratories. Rigid Pavement Laboratory, Mariemont, Ohio. Final report on research under Contracts W-33-017-ENG-3729 & 3780 at Purdue University, Dept. of Agronomy, Agricultural Experiment Station, and School of Civil Engineering and Engineering Mechanics, Engineering Experiment Station, Lafayette, Ind. Aug 1949. 169p photos, graphs, tables Available from Ohio Division Laboratories, Mariemont, Ohio $4.00. PB 108830

A study was made of a number of factors involved in establishing turf on stabilized granular materials. Fertility, grass species, root penetration, pH, varying binder soil content, and effect of turf on stability were the factors studied in the greenhouse and in the field. Results of turf research were presented by Willis H. Skrdla as a thesis to the faculty of Purdue University.

Numerical index supplement to the Bibliography of Technical Reports, vol. 18, Jul-Dec 1952, compiled by D. W. Graf. U. S. Office of Technical Services. Jan 1953. 8p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 98050s8

RELISTED REPORTS

Determination of microwave atmospheric absorption using extraterrestrial sources, by M. Schulkin. U. S. Naval Research Laboratory. Oct 1951. 30p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 105592

1. Atmosphere - Sound absorption 2. Radio waves - Atmosphere effects 3. Radiometers 4. Radio waves - Propagation - Curves 5. Radiation, Galactic - Measurement 6. Solar radiation - Disturbances 7. NRL R 3843.

Determination of shock isolator performance, by J. Paul Walsh and Ralph E. Blake. U. S. Naval Research Laboratory. Jan 1950. 19p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Now available Mimeo: $.75. PB 101170

A method of determining the performance of shock mounts is described. The criterion of performance is the shock spectrum of the motion of the rigid load on the mount, since this is related to the likelihood of damage to almost all equipments and since the prevention of damage is the function of a shock mount. The standard Navy Shock Machine motions are used. Results are presented for some typical mounts obtained using this method and a comparison is made between mount characteristics determined using rigid test load and those expected if load were flexible. Was listed in Bib. v. 14, p. 241.

Lurgi apparatebau and Lurgi Chemie, Frankfurt A. M. Design of sulphuric acid plants. Heppenstall, F. and others. Jun-Jul 1946. 25p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 98276

1. Sulfuric acid - Plants - Germany 2. Lurgi Apparatebau Frankfurt am Main, Ger. 3. Lurgi Gesellschaft für Chemie und Hüttenwesen m.b.H., Frankfurt am Main, Ger. 4. BIOS FR 1631, Item 22.

Models T-7 and T-8 U. S. Coast Guard radio transmitter, phone CW and TCW, frequency range 2,000 to 3,000 kilocycles, 150 to 100 meters. Instruction book. Westinghouse Electric & Manufacturing Co., Chicopee Falls, Mass. n.d. 35p photos, fold, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 104768

1. T-7 (Radio transmitter) 2. T-8 (Radio transmitter) 3. Radio transmitters - Operation 4. U. S. Coast Guard.

Preventive maintenance plan for government motor vehicles. U. S. Interdepartmental Motor Equipment Committee. Oct 1948. 33p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 96488

1. Motor vehicles - Maintenance and repair.

Telecommunications and equipment in Germany during the period 1939-1945, prepared by the General Post Office. British Intelligence Objectives Sub-Committee. 1950. 56p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 100974